Vol. 1116 Number 6

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Apr. 30, 1990, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of June 29, 1990.

Chemical Discipline -	August 8, 1989
Mechanical Discipline -	December 1, 1988
Electrical Discipline -	January 11, 1989

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of June 29, 1990.

Chemical -	March 1, 1989
Electrical -	June 15, 1989
Mechanical -	September 1, 1989

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of June 1990.

Affirmed	203
Affirmed-in-Part	46
Reversed	129
Total Decided	378

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on July 28, 1987, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,682,371 through 4,683,591
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 26, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,394,781 through 4,395,780
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 20, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,329,787	06/258,391	5/18/82
4,329,808	06/227,570	5/18/82
4,329,828	06/231,578	5/18/82
4,329,937	06/244,870	5/18/82
4,329,984	06/224,758	5/18/82
4,329,989	06/237,219	5/18/82
4,330,046	06/277,676	5/18/82
4,330,268	06/235,411	5/18/82
4,330,269	06/225,146	5/18/82
4,330,304	06/263,219	5/18/82
4,330,342	06/238,329	5/18/82
4,330,344	06/221,060	5/18/82
4,330,353	06/236,535	5/18/82
4,330,355	06/222,387	5/18/82
4,330,372	06/268,253	5/18/82
4,330,379	06/231,477	5/18/82
4,330,386	06/222,275	5/18/82
4,330,400	06/230,006	5/18/82
4,330,403	06/249,426	5/18/82
4,330,415	06/267,897	5/18/82
4,330,425	06/231,773	5/18/82
4,330,466	06/217,187	5/18/82
4,330,482	06/218,394	5/18/82
4,330,489	06/233,161	5/18/82
4,330,512	06/215,875	5/18/82
4,330,515	06/217,631	5/18/82
4,330,532	06/222,765	5/18/82
4,330,547	06/217,948	5/18/82
4,330,603	06/229,360	5/18/82
4,589,146	06/668,010	5/20/86
4,589,148	06/678,182	5/20/86
4,589,153	06/597,072	5/20/86
4,589,181	06/441,321	5/20/86
4,589,186	06/730,436	5/20/86
4,589,201	06/724,362	5/20/86
4,589,206	06/653,207	5/20/86
4,589,207	06/633,868	2/50/86
4,589,209	06/586,674	5/20/86
4,589,222	06/319,906	5/20/86
4,589,229	06/223,145	5/20/86
4,589,241	06/537,286	5/20/86
4,589,248	06/636,622	5/20/86
4,589,250	06/678,169	5/20/86
4,589,264	06/690,368	5/20/86
4,589,266	06/627,510	5/20/86
4,589,269	06/617,625	5/20/86
4,589,271	06/585,840	5/20/86
4,589,276	06/680,865	5/20/86
4,589,278	06/615,993	5/20/86
4,589,283	06/632,126	5/20/86
4,589,292	06/678,241	5/20/86
4,589,307	06/650,259	5/20/86
4,589,320	06/692,558	5/20/86
4,589,333	06/727,442	5/20/86
4,589,334	06/512,691	5/20/86
4,589,337	06/770,176	5/20/86
4,589,339	06/649,899	5/20/86
4,589,340	06/573,343	5/20/86
4,589,351	06/664,022	5/20/86
4,589,353	06/696,176	5/20/86
4,589,354	06/683,375	5/20/86
4,589,365	06/665,949	5/20/86

Patent Number	Serial Number	Issue Date
4,589,376	06/661,065	5/20/86
4,589,381	06/654,456	5/20/86
4,589,383	06/502,574	5/20/86
4,589,385	06/710,712	5/20/86
4,589,398	06/583,694	5/20/86
4,589,399	06/712,535	5/20/86
4,589,405	06/660,216	5/20/86
4,589,406	06/521,990	5/20/86
4,589,409	06/546,652	5/20/86
4,589,410	06/754,969	5/20/86
4,589,419	06/667,130	5/20/86
4,589,427	06/681,363	5/20/86
4,589,429	06/668,554	5/20/86
4,589,445	06/574,762	5/20/86
4,589,450	06/731,505	5/20/86
4,589,463	06/655,517	5/20/86
4,589,487	06/642,029	5/20/86
4,589,496	06/605,035	5/20/86
4,589,504	06/634,956	5/20/86
4,589,519	06/784,205	5/20/86
4,589,520	06/456,313	5/20/86
4,589,521	06/769,507	5/20/86
4,589,522	06/757,535	5/20/86
4,589,525	06/610,600	5/20/86
4,589,529	06/698,077	5/20/86
4,589,530	06/749,094	5/20/86
4,589,531	06/607,660	5/20/86
4,589,544	06/596,408	5/20/86
4,589,547	06/458,072	5/20/86
4,589,548	06/679,208	5/20/86
4,589,554	06/523,040	5/20/86
4,589,557	06/627,910	5/20/86
4,589,571	06/633,401	5/20/86
4,589,573	06/417,876	5/20/86
4,589,577	06/568,186	5/20/86
4,589,578	06/587,078	5/20/86
4,589,586	06/770,568	5/20/86
4,589,587	06/567,401	5/20/86
4,589,600	06/771,135	5/20/86
4,589,608	06/717,569	5/20/86
4,589,617	06/689,519	5/20/86
4,589,624	06/612,726	5/20/86
4,589,626	06/711,184	5/20/86
4,589,627	06/695,266	5/20/86
4,589,633	06/573,961	5/20/86
4,589,634	06/476,073	5/20/86
4,589,635	06/613,260	5/20/86
4,589,636	06/666,220	5/20/86
4,589,643	06/606,694	5/20/86
4,589,646	06/672,663	5/20/86
4,589,660	06/745,313	5/20/86
4,589,666	06/758,713	5/20/86
4,589,668	06/572,559	5/20/86
4,589,669	06/664,452	5/20/86
4,589,677	06/651,322	5/20/86
4,589,681	06/549,774	5/20/86
4,589,699	06/614,744	5/20/86
4,589,705	06/662,095	5/20/86
4,589,708	06/462,986	5/20/86
4,589,722	06/606,400	5/20/86
4,589,733	06/626,133	5/20/86
4,589,741	06/685,007	5/20/86
4,589,743	06/709,963	5/20/86
4,589,792	06/465,929	5/20/86
4,589,802	06/450,991	5/20/86
4,589,806	06/710,854	5/20/86
4,589,808	06/671,924	5/20/86
4,589,814	06/637,292	5/20/86
4,589,830	06/724,049	5/20/86
4,589,832	06/705,798	5/20/86
4,589,845	06/694,248	5/20/86
4,589,846	06/427,850	5/20/86
4,589,853	06/666,087	5/20/86
4,589,854	06/671,992	5/20/86
4,589,858	06/586,682	5/20/86
4,589,869	06/552,133	5/20/86
4,589,887	06/728,583	5/20/86
4,589,889	06/739,625	5/20/86
4,589,898	06/682,400	5/20/86
4,589,906	06/479,772	5/20/86
4,589,913	06/715,790	5/20/86
4,589,914	06/594,012	5/20/86
4,589,915	06/703,164	5/20/86
4,589,926	06/613,597	5/20/86
4,589,927	06/615,026	5/20/86
4,589,929	06/578,547	5/20/86
4,589,930	06/584,821	5/20/86
4,589,933	06/744,431	5/20/86
4,589,938	06/631,359	5/20/86
4,589,947	06/591,522	5/20/86
4,589,955	06/520,798	5/20/86
4,589,971	06/615,049	5/20/86
4,589,973	06/754,938	5/20/86
4,589,981	06/560,730	5/20/86
4,589,984	06/642,374	5/20/86
4,589,992	06/661,624	5/20/86
4,589,999	06/687,361	5/20/86
4,590,009	06/728,699	5/20/86
4,590,024	06/594,456	5/20/86
4,590,037	06/707,578	5/20/86
4,590,041	06/674,102	5/20/86
4,590,042	06/685,650	5/20/86
4,590,078	06/502,508	5/20/86
4,590,082	06/768,706	5/20/86
4,590,105	06/667,585	5/20/86
4,590,108	06/629,624	5/20/86
4,590,112	06/696,447	5/20/86
4,590,136	06/718,063	5/20/86
4,590,148	06/710,892	5/20/86
4,590,159	06/523,904	5/20/86
4,590,164	06/593,127	5/20/86
4,590,166	06/477,479	5/20/86
4,590,180	06/487,645	5/20/86
4,590,183	06/725,447	5/20/86
4,590,192	06/537,048	5/20/86
4,590,198	06/578,048	5/20/86
4,590,204	06/596,981	5/20/86
4,590,211	06/615,661	5/20/86
4,590,214	06/277,174	5/20/86
4,590,245	06/591,591	5/20/86
4,590,251	06/682,487	5/20/89
4,590,260	06/709,586	5/20/86
4,590,261	06/680,665	5/20/86
4,590,264	06/522,270	5/20/86
4,590,269	06/594,508	5/20/86
4,590,272	06/657,323	5/20/86
4,590,273	06/594,366	5/20/86
4,590,280	06/712,307	5/20/86
4,590,282	06/653,277	5/20/86
4,590,301	06/664,282	5/20/86
4,590,305	06/587,651	5/20/86
4,590,306	06/702,662	5/20/86
4,590,309	06/727,621	5/20/86
4,590,328	06/588,150	5/20/86
4,590,330	06/667,215	5/20/86
4,590,332	06/653,781	5/20/86
4,590,335	06/665,459	5/20/86
4,590,345	06/643,796	5/20/86
4,590,361	06/739,303	5/20/86
4,590,366	06/625,467	5/20/86
4,590,374	06/656,044	5/20/86
4,590,378	06/616,998	5/20/86
4,590,381	06/744,269	5/20/86
4,590,409	06/629,756	5/20/86
4,590,416	06/670,163	5/20/86
4,590,419	06/668,428	5/20/86
4,590,427	06/479,581	5/20/86
4,590,447	06/521,239	5/20/86
4,590,449	06/639,704	5/20/86
4,590,459	06/733,878	5/20/86
4,590,471	06/566,351	5/20/86
4,590,475	06/544,937	5/20/86
4,590,481	06/523,014	5/20/86
4,590,505	06/569,639	5/20/86
4,590,536	06/747,039	5/20/86
4,590,543	06/668,153	5/20/86

Patent Number	Serial Number	Issue Date
4,590,548	06/597,787	5/20/86
4,590,554	06/443,937	5/20/86
4,590,591	06/515,831	5/20/86
4,590,594	06/554,729	5/20/86
4,590,609	06/498,570	5/20/86
4,590,612	06/488,098	5/20/86
4,590,619	06/607,813	5/20/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,740,498, Re. S. N. 07/514,053, Filed April 24, 1990, Cl. 514/8, FIBRONECTION PREPARATIONS, Yutaka Hirao, et al., Owner of Record: *Green Cross Corp., Osaka-Shi, Japan*, Attorney or Agent: Louis Gubinsky, Ex. Gp.: 186

4,741,547, Re. S. N. 07/518,176, Filed May 3, 1990, Cl. 280/250.1, FOLDING WHEELCHAIR, Alan L. Tholkes, Owner of Record: *Inventor*, Attorney or Agent: Douglas L. Tschida, Ex. Gp.: 316

4,747,451, Re. S. N. 07/505,346, Filed April 5, 1990, Cl. 166/53, LEVEL SENSOR, Harold P. Adams, et al., Owner of Record: *Oil Well Automation, Inc., Seneca, Pa.*, Attorney or Agent: David C. Hanson, Ex. Gp.: 356

4,751,668, Re. S. N. 07/537,494, Filed June 12, 1990, Cl. 364/900, PORTABLE ELECTRONIC MEMORANDUM DEVICE, Fumiaka Aihara, Owner of Record: *Casio Computer Co., Ltd., Tokyo, Japan*, Attorney or Agent: Thomas Langer, Ex. Gp.: 236

4,793,387, Re. S. N. 07/536,310, Filed June 11, 1990, Cl. 141/86, OVERFILL SPILLAGE PROTECTION DEVICE, Leo J. LeBlanc, et al., Owner of Record: *Enterprise Brass Works, Inc., Muskegon, Mich.*, Attorney or Agent: Andrew R. Basile, Ex. Gp.: 243

4,817,921, Re. S. N. 07/536,697, Filed June 12, 1990, Cl. 267/33, COMPOSITE SPRING, Andrew Stevenson, Owner of Record: *The Paton Corp., Seattle, Wash.*, Attorney or Agent: Robert J. Gaybrick, Ex. Gp.: 313

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,228,225, 90/002,056, Requested June 18, 1990, Cl. 429/147, BATTERY SEPERATOR, Dennis D. O'Rell, et al., Owner of Record: *W. R. Grace & Co., Lexington, Mass.*, Attorney or Agent: Gary Levin, Ex. Gp.: 112, Requester: Owner

4,430,343, 90/002,059, Requested June 18, 1990, Cl. 424/250, BENZIMIDAZOLE DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF, AND PHARMECEUTICAL COMPOSITION CONTAINING THE SAME, Ryuichi Iemura, et al., Owner of Record: *Kanebo, Ltd., Tokyo-To, Japan*, Attorney or Agent: Wegner & Bretschneider, Washington, D. C., Ex. Gp.: 122, Requester: Owner

4,648,907, 90/002,054, Requested June 12, 1990, Cl. 106/030, HIGH COLOR STRENGTH DIARYLIDE YELLOW PIGMENT COMPOSITIONS, Byron G. Hays, et al., Owner of Record: *BASF Corp., A Corp. of De., Clifton, N. J.*, Attorney or Agent: E. Richard Skula, Ex. Gp.: 157, Requester: Ciba-Geigy Corp., Hawthorne, N. Y.

4,731,335, 90/002,057, Requested June 18, 1990, Cl. 436/180, METHOD FOR TREATING THIN SAMPLES ON A SURFACE EMPLOYING CAPILLARY FLOW, David J. Brigati, Owner of Record: *Fisher Scientific Co., A Corp., of De., Pittsburgh, Pa.*, Attorney or Agent: Alan M. Doernberg, Ex. Gp.: 181, Requester: Owner

4,738,713, 90/002,055, Requested June 15, 1990, Cl. 075/010.180, METHOD FOR INDUCTION MELTING REACTIVE METALS AND ALLOYS, Donald L. Stickle, et al., Owner of Record: *Duriron Co., Inc., Dayton, Ohio*, Attorney or Agent: W. J. Speranza, Ex. Gp.: 111, Requester: Retech, Inc., Ukiah, Calif

4,745,768, 90/002,058, Requested June 18, 1990, Cl. 358/084, SYSTEM FOR EVALUATION AND RECORDING OF RESPONSES TO BROADCAST TRANSMISSIONS, Henry Von Kohorn, Owner of Record: *Inventor, Stamford, Conn.*, Attorney or Agent: Marty R. Perman, Perman & Green, Ex. Gp.: 261, Requester: J. Ernest Kenny, Bacon & Thomas, Alexandria, Va.

COMMISIONER ORDERED REEXAMINATION

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,807,108, 90/002,060, Requested June 22, 1990, Cl. 364/148, PRODUCT REALIZATION METHOD, David Ben-Arieh, et al., Owner of Record: *AT & T, Bell Labs, A Corp. of N.Y., Murray Hill, N. J.*, Attorney or Agent: John P. McDonald, Ex. Gp.: 236, Requester: CODR

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Megahaus Corp., San Diego, Calif., Reg. No. 1,441,922 for the mark "FIRST IMPRESSION", Canc. No. 18,624.

JEAN BROWN
Administrator of the
Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Status of PTO Services

The following is an update of the status of PTO services for June 1990:

Service Item	FY 1990 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	16
Trademarks	30	61
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	2
Mail Coupons	12	6
Letter Orders	16	16
Electronic Ordering Service (EOS)	11	3
Certified Copies:		
Trademark Registrations	21	14
Applications-As-Filed	17	10
File-Wrapper/Contents	N/A	14
Walk-up Certification	1	1
Patent Application Expedited	5	6
Trademark Search Library:		
Filing Pending Marks	23	41
Filing Reg. Certificates	Issue Date+2 days	+ 1 Day
Filing Temp. Drawings	8	18
Assignments:		
Recording Patent-New Applications	20**	14
Recording Patent-Mail Room Recpts.	20	15
Receipt Date of Bulk Pat. Docs. Returned by End of Month		May 11-18, 1990
Recording Trademarks	20	21
Receipt Date of Bulk Trademarks Documents Returned by end of Month		May 11-18, 1990
Avg. Days from Issue Fee Payment to Issue Date	90-100	93
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	+11 Days
Trademark Copies Available	95% on Issue Date	99% on Issue Date

* Unless otherwise noted.
** Recalibrated to reflect goal of 20 days to record after the date the filing receipt is mailed.

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•*Filming of Assignments - Submission of Multiple Copies*• The Office is now filming all papers received with a request to record an assignment. This includes the actual assignment document, any cover letters, and attachments. The Assignment Branch frequently receives multiple copies of papers submitted with assignment requests. In order to reduce the stamping and filming of multiple copies of documents, please do not send additional copies of the assignment itself or any attachment to it. Only one copy of the transmittal or cover letter should be submitted with the exception that when fees are to be charged to a deposit account, three copies should be provided to expedite processing.

July 5, 1990

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

PATENT NOTICES

Certificates of Correction For Week of July 31, 1990

D. 301,898	4,807,242	4,847,392	4,858,748
4,158,957	4,810,451	4,847,565	4,858,841
4,504,306	4,810,920	4,847,591	4,859,105
4,629,753	4,812,245	4,847,604	4,859,319
4,635,296	4,813,268	4,847,649	4,859,331
4,655,547	4,813,982	4,847,928	4,859,383
4,678,991	4,814,039	4,849,134	4,859,666
4,987,998	4,814,197	4,849,230	4,859,807
4,707,388	4,814,421	4,849,770	4,859,977
4,727,362	4,814,842	4,849,921	4,860,113
4,729,111	4,815,893	4,850,439	4,860,118
4,730,416	4,817,131	4,850,488	4,860,151
4,731,164	4,817,776	4,850,716	4,860,571
4,733,940	4,818,306	4,850,751	4,860,968
4,734,546	4,821,627	4,851,101	4,861,494
4,735,914	4,823,263	4,851,345	4,861,956
4,748,125	4,826,736	4,851,465	4,862,060
4,753,673	4,826,795	4,851,621	4,862,362
4,754,803	4,826,853	4,852,344	4,862,427
4,759,414	4,827,057	4,852,845	4,862,511
4,762,655	4,828,344	4,853,386	4,862,550
4,767,434	4,828,678	4,853,423	4,862,765
4,767,438	4,829,850	4,853,539	4,862,847
4,771,456	4,829,999	4,853,562	4,863,623
4,774,418	4,830,438	4,853,599	4,863,984
4,775,501	4,831,305	4,853,659	4,963,988
4,778,541	4,832,110	4,853,861	4,865,167
4,781,316	4,832,464	4,853,907	4,865,533
4,781,833	4,833,278	4,853,919	4,866,021
4,786,614	4,833,701	4,854,527	4,866,195
4,788,263	4,833,995	4,854,578	4,866,528
4,788,276	4,834,982	4,854,636	4,867,401
4,790,495	4,835,549	4,854,768	4,867,510
4,790,954	4,835,788	4,855,411	4,867,653
4,791,196	4,836,414	4,855,433	4,867,895
4,797,734	4,837,110	4,855,544	4,869,706
4,798,740	4,837,293	4,855,934	4,870,847
4,801,583	4,837,520	4,856,399	4,871,573
4,801,787	4,838,524	4,856,502	4,873,605
4,801,844	4,838,919	4,856,642	4,877,517
4,802,021	4,840,802	4,857,054	4,894,610
4,803,249	4,842,720	4,857,179	4,915,390
4,803,325	4,845,100	4,857,405	4,932,111
4,803,516	4,845,609	4,858,307	
4,803,928	4,846,457	4,858,434	
4,806,694	4,846,559	4,858,480	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

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Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
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Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
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Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.
Box SEQUENCE	All application papers, computer readable forms and fees related to applications containing nucleotide sequence and/or amino acid sequence disclosures in accordance with 37 CFR §§ 1.821 through 1.825.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8874
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
	Tampa: Tampa Campus Library, University of Central Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	Not Yet Operational
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	Not Yet Operational
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF June 16, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	10-18-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-20-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	3-8-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	3-31-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	4-22-88
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-24-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	5-5-89

Expiration of patents: The patents within the range of numbers indicated below expire during June 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,736,595 to 3,742,517 inclusive
Plant Patents	3,350 to 3,369 inclusive

REEXAMINATIONS

JULY 31, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,495,293 (1335th)
FLUOROMETRIC ASSAY

Mark R. Shaffar, Vernon Hills, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Reexamination Request No. 90/001,697, Jan. 23, 1989.
Reexamination Certificate for Patent No. 4,495,293, issued Jan. 22, 1985, Ser. No. 469,323, Feb. 24, 1983.
Int. Cl.[5] G01N *21/17, 21/25*
U.S. Cl. 436—172

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–12 is confirmed.

7. An improved fluorimetric assay method for determining a ligand in an assay solution containing a sample suspected of containing the ligand, and an effective amount of reagent system which in the presence of the ligand is capable of providing a change in the transmittive properties of the assay solution within a wavelength band, said improvement comprising adding to the assay solution an effective amount of a fluorescer wherein the fluorescer does not react either chemically or immunologically with the ligand or the reagent system, and wherein the excitation and/or emission wavelength band of the fluorescer overlaps the wavelength band associated with the change in the transmittive properties of the assay solution; irradiating the assay solution with light having a wavelength within the excitation wavelength band of the fluorescer; and then measuring the intensity of the fluorescer emitted by the assay solution as a measure of the concentration of the ligand in the sample.

B1 4,785,035 (1336th)
CURING COMPOSITION

August L. L. Palluel, Windsor; Stephen P. Davis, High Wycombe Bucks, and Angela C. Fletcher, London, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Reexamination Request No. 90/001,926, Dec. 29, 1989.
Reexamination Certificate for Patent No. 4,785,035, issued Nov. 15, 1988, Ser. No. 114,735, Oct. 30, 1987.
Filed Dec. 29, 1989, Ser. No. 114,735
Claims priority, application United Kingdom, Nov. 14, 1986, 8627314
Int. Cl.[5] C08L *75/00*
U.S. Cl. 524—101

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–9 is confirmed.

New claim 10 is added and determined to be patentable.

1. A curing composition comprising a polymer component and a compatible oligomeric component, the polymer component being a co-polymer of functional silyl group-containing units derived from monomers of Formula (I):

$$CH_2{=}CR^1CO_2(CH_2)_aL \qquad \text{Formula (I)}$$

where a is 2 to 6
R^1 is hydrogen or methyl and
L is a group of Formula (II):

Formula (I)

where R^2 is C_{1-4} alkoxy, C_{2-4} alkoxy—C_{2-4} alkoxy, C_{1-4} alkanoyl, enolate or oximate, and R^3 and R^4 are C_{1-4} alkoxy, C_{2-4} alkoxy—C_{2-4} alkoxy, C_{1-4} alkanoyl, enolate, oximate or C_{1-6} alkyl; and structural units derived from polymerisable ethylenically unsaturated monomers such that each molecule of the polymer component contains at least two silyl groups of Formula (II); the oligomeric component being a compound of Formula (III):

$$E(GKL)_b \qquad \text{Formula (III)}$$

where b is 3 to 6; E is derived from a biuret or isocyanurate oligomer of a di-functional isocyanate, the isocyanate being a C_{4-15} aliphatic, cycloaliphatic or aromatic diisocyanate optionally substituted with one or more C_{1-6} alkyl groups or is derived from an adduct of C_{2-6} aliphatic diol, triol or tetraol and a poly functional isocyanate, the poly functional isocyanate being either a di-functional isocyanate as previously defined or being itself the adduct of an aliphatic triol and a di-functional isocyanate as previously defined, G is

$$-[O(CH_2)_cCO]_d[O(CH_2)_eOCO(CH_2)_f]-$$

in which c is 0 to 2, d is 2 to 4; K is

$$-[NR^5(CH_2)_m]-$$

in which m is 1 to 6, and R^5 is hydrogen, methyl, $-(CH_2)_nR^6$, or $-CH_2CHOH(CH_2)_n-R^6$ in which R^6 is the group L as defined with reference to Formula (I) and n is 1 to 4.

REISSUES

JULY 31, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,278

CONTINUOUSLY VARIABLE TRANSMISSION AND TORQUE RETAINING DIFFERENTIAL

Edward W. Johnshoy, R.R. #1, Box 258A, Mentor, Minn. 56736

Original No. 4,784,017, dated Nov. 15, 1988, Ser. No. 27,215, Mar. 17, 1987. Continuation-in-part of Ser. No. 881,827, Jul. 3, 1986. Application for reissue Dec. 30, 1988, Ser. No. 295,289

Int. Cl.[5] F16H *37/06, 1/40*

U.S. Cl. 475—6 **13 Claims**

1. A variable ratio transmission comprising:

first and second gear clusters;

means to rotatably mount the gear clusters about separate, parallel mounting axes for independent rotation relative to each other;

each of said gear clusters comprising a plurality of rotatable gears including an input gear rotatable about an axis coincident with its respective mounting axis, an output shaft, output gear means for driving the output shaft, and control gear means to effect a driving connection between the input gear and the output shaft through the output gear means;

means for simultaneously driving the input gears of both gear clusters; and

means for selectively and simultaneously controlling rotation of both of the gear clusters to simultaneously vary the effective ratio of rotation between the input gear and output shafts of both clusters through the output gear means of the clusters.

Re. 33,279

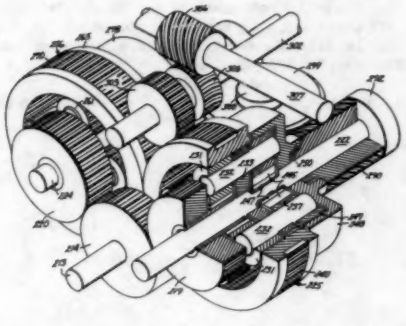
METHOD FOR RAPID ACQUISITION OF NMR DATA

Felix W. Wehrli, Shorewood, Wis., assignor to General Electric Company, Milwaukee, Wis.

Original No. 4,587,489, dated May 6, 1986, Ser. No. 539,780, Oct. 7, 1983. Continuation of Ser. No. 190,182, May 4, 1988, abandoned. Application for reissue Feb. 27, 1989, Ser. No. 315,242

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **23 Claims**



21. A method for shortening total NMR data acquisition time, comprising the steps of:

(a) positioning an NMR sample in a homogeneous magnetic field to create in at least a portion thereof a net longitudinal magnetization in a first direction of said homogeneous field, said net longitudinal magnetization having a magnitude M_z;

(b) irradiating said sample with an RF pulse to convert a fraction but not all, of said net longitudinal magnetization to transverse magnetization;

(c) reversing the direction of dephasing of said transverse magnetization to produce at least one echo signal; and

(d) sampling said echo signal to derive, upon analysis, NMR data from said sample.

Re. 33,280

SEMICONDUCTOR MEMORY DEVICE

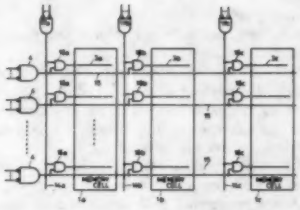
Masahiko Yoshimoto; Tsutomu Yoshihara; Kenji Anami, and Hirofumi Shinohara, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 4,554,646, dated Nov. 19, 1985, Ser. No. 542,388, Oct. 17, 1983. Application for reissue Nov. 19, 1987, Ser. No. 123,106

Claims priority, application Japan, Oct. 18, 1982, 57-184362; Oct. 20, 1982, 57-185817

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—189.01 **14 Claims**



1. A semiconductor memory device including a matrix of memory cells arranged in rows and columns, said semiconductor memory device comprising:

a plurality of groups of memory cells divided by segmenting said matrix in the direction of the columns;

memory cell group selection lines for every one of said groups for selecting any one of said plurality of the groups of said memory cells;

row decoders for every one of said rows for decoding of row address information for a particular memory cell to be accessed;

preceding word lines each connected to the output of each of said row decoders;

[AND gates each provided for providing a logical product of a group enable signal carried on said memory cell group selection line and a row enable signal from said row decoders on said preceding word lines;]

group word lines each provided per group and per row [for receiving the logical product output from each of said AND gates]; *and*

means for selectively activating said group word lines including selector means providing a memory cell group selecting signal to at least one said memory cell group selection line and means responsive to said memory cell group selecting signal carried on said memory cell group selection line and a row enable signal from said row decoders on one of the preceding word lines for driving a selected group word line;

wherein said particular memory cell is accessed [with the logical product output from the corresponding one of said group word lines].

Re. 33,281

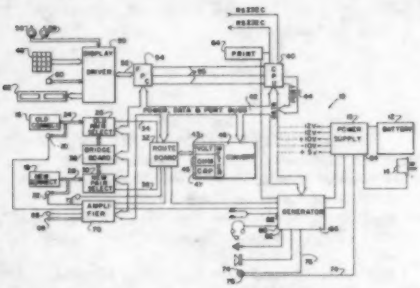
CABLE ANALYZER WITH D.C. FUNCTIONS

Jimmy C. Ray, and H. Wayne Matthews, both of Dennison, Tex., assignors to Communications Technology Corporation, Dallas, Tex.

Original No. 4,611,099, dated Sep. 9, 1986, Ser. No. 666,836, Oct. 31, 1984. Application for reissue Nov. 23, 1988, Ser. No. 276,426

Int. Cl.[5] H04B *3/46*

U.S. Cl. 379—25 **16 Claims**



1. A telphone cable analyzer comprising:

a. at least one plug connector whereby a plurality of telephone wires in pars may be attached by the plug to the analyzer,

b. a routing circuit,

c. at least one pair selector interconnecting the plug and routing circuit,

d. said pair selector including means for attaching any pair of wires to the routing circuit,

e. a converter connected to the routing circuit,

f. said converter including means for converting analog signals to binary digital signals,

g. said routing circuit including means for routing a pair of wires to said converter, and

h. a central processing unit connected to the pair selector, routing circuit, and converter,

i. said central processing unit including means for controlling the pair selector, the routing circuit, and converter, [and]

j. said central processing unit including means for analyzing, storing, and transmitting data from the converter, routing circuit, and pair selector,

k. means for transmitting data from the central processing unit to remote locations in RS232C format, and

l. means for receiving instruction in RS232C format from remote locations and controlling the central processing unit therewith.

Re. 33,282

LIQUID GAS-OPERATED LIGHTER

Friedrich Schächter, Vienna, Austria, assignor to BIC Corporation, Milford, Conn.

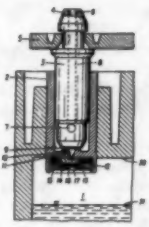
Original No. 4,560,345, dated Dec. 24, 1985, Ser. No. 403,499, Nov. 23, 1981. Application for reissue Dec. 21, 1987, Ser. No. 136,594

Claims priority, application Austria, Nov. 24, 1980, 5726/80

Int. Cl.[5] F23D *13/04*

U.S. Cl. 431—344 **42 Claims**

22. Liquid gas-operated lighter, such as a pocket lighter, comprising a burner tip, a fuel tank and, arranged therebetween, a valve assembly serving as the only means of communication between said fuel tank and said burner tip, an annular flange formed at an end face of said valve assembly facing said fuel tank, said flange defining a recess, said valve assembly including a valve bore opening to said recess and communicating with said valve, a control device for the flame height which device is non-alterable by the user of the lighter, said control device received in said recess and including a fuel-permeable proportioning disk, said proportioning disk tightly braced in its border region toward said end face by means of a bracing member so that gas is enabled to flow only through said proportioning disk, the border region formed between said end face and said bracing member is rendered permanently gas-tight, said bracing member secured in its position by securing means formed on said flange and provided with passage means for the fuel, said proportioning disk on the side facing said burner tip directly facing a hollow space in the absence of a gas permeable structural component, the cross-sectional area of said hollow space perpendicularly to the axis of said proportioning disk determining the position and size of the surface of said proportioning disk which



permits passage of fuel therethrough, characterized in that said proportioning disk is a flexible microporous film having slot-shaped pores oriented in the direction perpendicular to the surface of said disk, said slot-shaped pores directing said gas into said hollow space which space comprises means for passage of said gas into said valve bore, and that said bracing member together with said flange forms the conclusion of the lower end of said control device and, in the vertical position of use of said lighter, said lower end is always spaced at a distance above the liquid phase of the liquid gas, and that the space between said lower end and the liquid level is free from structural components, so that said lower end of said control device is exposed exclusively to the gaseous phase of the fuel in the vertical position of use of the lighter.

Re. 33,283

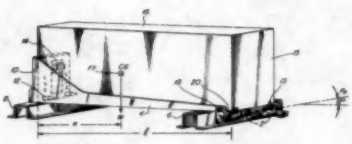
PIVOTABLE EXTRACTOR HOLD DOWN APPARATUS

Robert A. Hollingsead, La Habra, and Clyde R. Pryor, Anaheim, both of Calif., assignors to Hollingsead International, Inc., Santa Fe Springs, Calif.

Original No. 4,018,091, dated Apr. 19, 1977, Ser. No. 608,565, Aug. 28, 1975. Continuation of Ser. No. 297,766, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 360,113, May 14, 1973, abandoned. Application for reissue Feb. 25, 1983, Ser. No. 469,768

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—296 **8 Claims**



7. In an insertion, holddown and extraction apparatus for inserting an electronic unit in and removing it from a substantially horizontal supporting surface in which the electronic unit has the first half of a cable connector mounted at the back end thereof above the supporting surface and the supporting structure has a second half of said connector mounted thereon in a mating position with respect to the first half of the connector, the mating and unmating of the connector halves being accomplished by applying

forces to the front end of the unit to slide the unit along the supporting surface, the combination which comprises:

means mounted to the supporting structure below the supporting surface thereof and being arranged to be removably attached to the front end of the unit for applying insertion and extraction forces to slide the unit along the supporting surface and mate and unmate the connector halves, respectively, the insertion forces having a vertical component directed downwardly toward the supporting surface and a horizontal component directed towards the rear end of the unit to cause the connector halves to mate; and

means for controlling the angle of application of said extraction forces so that the apparatus exerts a horizontal component away from the rear of the unit and substantially no vertical upward component and absorbs upward forces tending to lift the front of the unit off the supporting surface for the duration of the extraction of said first and second halves of the connector whereby the front of the electronic unit is prevented from moving upwardly while the connector halves are being unmated.

Re. 33,284

METHOD FOR THE POLYMERIZATION OF VINYL CHLORIDE MONOMER IN AN AQEOUS MEDIUM

Kenichi Itoh, Clute, Tex.; Genji Noguki, Yamaguchi, Japan; Motoaki Tanaka; Hitoshi Ohba, both of Saitama, Japan, and Masahiko Watase, Tokyo, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Original No. 4,694,053, dated Sep. 15, 1987, Ser. No. 748,433, Jun. 25, 1985. Application for reissue Nov. 30, 1987, Ser. No. 126,907

Claims priority, application Japan, Jun. 29, 1984, 59-134177

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[3] C08F *2/00*

U.S. Cl. 526—74 **4 Claims**

1. In a method for the suspension polymerization of vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride in an aqueous medium in the presence of a monomer-soluble polymerization intiator, an improvement which comprises admixing the aqueous medium with:

(a) a water-soluble crosslinked copolymer of 100 parts by weight of acrylic acid and from 0.05 to 10 parts by weight of [bisallyl ether or] bismethallyl ether of diethyleneglycol; and

(b) a non-ionic surface active agent.

Re. 33,285

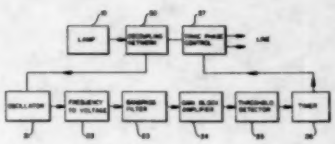
TOUCH CONTROLLED SWITCH FOR A LAMP OR THE LIKE

Scott M. Kunes, 2091-A Wantagh Ave., Wantagh, N.Y. 11793

Original No. 4,668,877, dated May 26, 1987, Ser. No. 754,245, Jul. 12, 1985. Continuation-in-part of Ser. No. 620,070, Jun. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 590,185, Mar. 16, 1984, abandoned. Application for reissue May 17, 1989, Ser. No. 352,865

Int. Cl.[5] H05B *37/02*

U.S. Cl. 307—116 **16 Claims**



1. An electronic control module to control the power to a lamp from an AC power source, the control module having a means to control the power to the lamp, said lamp having an external conductive surface and a two-conductor power cord within the lamp, said power to be controlled by touching said external conductive surface; characterized in that said control module removably plugs into said power source and the control module is not physically connected to the lamp except by the power cord, said power cord is removably insertable into the control module so that any lamp with a conductive external surface may be thus controlled, wherein the only connection between the lamp and control module is the said power cord and the only communication path between the lamp structure and the said power cord is the distributed capacitance existing between them; said control module including a high-frequency oscillator [having an operating frequency above the commercial AM broadcast band] and inductor means to electrically decouple the lamp power cord from the power source at said oscillator frequency, the said oscillator responding to touch to the lamp external conductive surface, such touching of said external conductive surface increasing the lamp capacitance, which change of capacitance is communicated to the oscillator through the power cord, and the oscillator being controlled by the combined capacitance of the lamp and power cord.

PLANT PATENTS

GRANTED JULY 31, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,282

GROUNDCOVER ROSE PLANT NAMED 'FLOWER CARPET'

Werner Noack, Guetersloh, Fed. Rep. of Germany, assignor to Pan-Am Northwest, Inc., Surrey, Canada

Filed May 2, 1989, Ser. No. 346,393
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of groundcover rose plant, substantially as shown and described, characterized particularly by low, spreading, dense growth habit and deep pink flowers.

7,283

PRIMOCANE RASPBERRY NAMED "PER HUB"

Tony Huber, Laval, Canada, assignor to W. H. Perron et Cie. LTEE, Quebec, Canada

Filed Apr. 6, 1988, Ser. No. 178,432
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—46 1 Claim

1. A new and distinct cultivar of *Rubus idaeus* var. strigosus, named Per Hub, as herein shown and described, characterized particularly as to uniqueness by the combined characteristics of primocane fruiting, vigorous canes and growth, good size and taste of fruit, hardiness, adaptation and good resistance to diseases and insects, producing conical berries approximately 35 mm in length and 25 mm in diameter.

7,284

KALANCHOE PLANT NAMED BASHFUL

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1989, Ser. No. 318,057
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Bashful, as illustrated and described.

7,285

BEGONIA PLANT NAMED CAMELOT

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jun. 2, 1989, Ser. No. 360,423
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct Begonia plant named Camelot, as illustrated and described.

7,286

KALANCHOE PLANT NAMED PASSIONATE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1989, Ser. No. 318,056
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Passionate, as illustrated and described.

7,287

CHRYSANTHEMUM PLANT NAMED SIGLO

Keith G. Lintott, Sussex, England, assignor to Framptons Nurseries Ltd., West Sussex, England

Filed Mar. 4, 1988, Ser. No. 164,344
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—80 1 Claim

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey of the pink spray type substantially as herein shown and described, characterized particularly as to novelty by year-round flowering, vigorous growth, and good flower size.

PATENTS

GRANTED JUL. 31, 1990

ERRATA

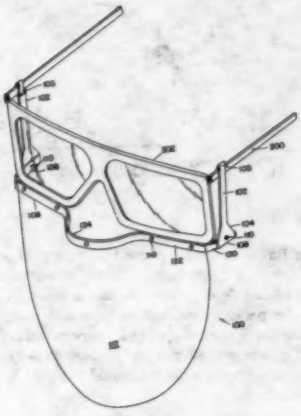
For CLASS	See PATENT NO.
137-015	4,944,101
042-071	4,944,109
051-363	4,944,128
134-167	4,944,258
227-176	4,944,295
443-028	4,944,410
224-042	4,944,434
296-188	4,944,553
296-039	4,944,612
116-173	4,944,656
446-074	4,944,704
440-061	4,944,705
420-469	4,944,797
420-085	4,944,798
148-108	4,944,805
434-073	4,944,939
523-179	4,945,015
524-081	4,945,016
524-111	4,945,017
524-141	4,945,018
525-063	4,945,124
502-128	4,945,142
556-016	4,945,174
585-417	4,945,175
340-455	4,945,277
313-479	4,945,282
313-450	4,945,283
313-414	4,945,284
313-278	4,945,285
313-105	4,945,286
250-236	4,945,287
313-025	4,945,288
174-113	4,945,342
372-013	4,945,539
378-130	4,945,562

PATENTS

GRANTED JULY 31, 1990

GENERAL AND MECHANICAL

4,944,039
PROTECTIVE MASK
Ursula Dietrich, 1588 Wedgewood, Hillsborough, Calif. 94010
Filed May 26, 1989, Ser. No. 357,525
Int. Cl.[5] A61F *9/00*
U.S. Cl. 2—13 **14 Claims**



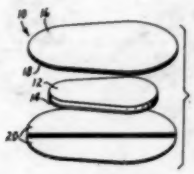
1. A protective face mask attachable t glasses said mask comprising:

a thin frame generally formed to cross transversely over the bridge of the nose, below the eyes and across the cheeks of the user;

a protective cover attached to said frame and extending freely therefrom to hand in front of the nose and mouth of the user; and

attachment means for attaching said frame to said glasses, said attachment means being arms, each arm having a first end and a second end, said first end being rotatably attached to said frame, said second end being attachable by hooking to said glasses.

4,944,040
LIGHT OCCLUSIVE EYE PATCH
John E. Riedel, White Bear Lake, and Frederick O. Olsen, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 878,995, Jun. 26, 1986, Pat. No. 4,793,003. This application Dec. 19, 1988, Ser. No. 286,532
Int. Cl.[5] A61F *9/04*
U.S. Cl. 2—15 **11 Claims**



10. A self adherent eye patch comprising:

an absorbent pad shaped to fit over the eye having a nonadherent lower surface for contacting the eye and an opposing upper surface;

a backing having a lower face adhered to said upper surface of said absorbent pad and extending outward from the periphery thereof;

pressure sensitive adhesive coating on the lower surface of said backing for adhering the eye patch to the eye socket; said adhesive being capable of blocking at least 95 percent of the light of a preselected wavelength impinging thereon; and

a removable protective liner covering said nonadherent lower surface of said absorbent pad and the exposed portion of said pressure sensitive adhesive.

4,944,041
CUFF CONSTRUCTIONS
Anne M. Buenos, 424 Habersham St., Savannah, Ga. 31401; Jane M. Buenos, 425 Riverside Dr., New York, N.Y. 10025, and Leroy M. Sylverst, 910 Riverside Dr., Apt. 4G, New York, N.Y. 10032
Division of Ser. No. 860,403, May 7, 1986, Pat. No. 4,756,027. This application Jun. 24, 1988, Ser. No. 211,009
Int. Cl.[5] A41D *27/18*
U.S. Cl. 2—84 **10 Claims**

1. A cuff construction for an article of clothing, comprising:

an opening formed at a neck portion in the article of clothing;

a cuff having an inner surface and an outer surface formed about the opening and having a distal end;

a panel having a distal end and two adjacent sides secured to the distal end of the cuff, the panel having a first side extending for at least a portion of the perimeter of the distal ends of the cuff at the opening forming a fold line and the first side of the panel secured to the cuff at the opening and the two adjacent sides of the panel secured to the cuff for forming a pocket access facing away from the opening to define a first open position, the panel adapted to be folded about a fold line from the first open position to a second closed position, the first open position allowing the head and neck of a wearer to pass through the opening in the article of clothing and in the second closed position the panel folded over the opening to form a covering for at least a portion of the wearer's head.

5. A cuff construction for an article of clothing, comprising:

an opening formed at a neck portion in the article of clothing;

a cuff formed about the opening and having a distal end; and

a panel integrally formed at the distal end of the cuff extending around the perimeter of the distal end of the cuff to form a fold line, the panel adapted to be folded about the fold line from a first open position to a second closed position, the first open position allowing the head of a wearer to pass through the opening in the article of clothing, and in the second closed position the panel folded over the opening to form a covering for the wearer's head.

4,944,042

ARTICLE WITH CONTAINER-FORMING PORTION

Thomas E. DeWan, 5945 Carrier St., St. Petersburg, Fla. 33714

Filed Mar. 17, 1989, Ser. No. 325,518
Int. Cl.[5] A41D 3/02
U.S. Cl. 2—94 26 Claims

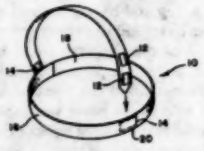
1. An article of flexible material having a tubular portion which is functional during normal use of the article and which is adapted to form a container for the article when the article is not in use, said tubular portion constituting a container-forming portion having first and second opposite open ends, at least one open end defining a mouth through which the article, when not in use, may be stuffed into said container-forming portion, first means carried by the article for at least partially closing the first open end of the container-forming portion, and second means carried by the article for at least partially closing the second open end of the container-forming portion whereby, with the article stuffed in said container-forming portion and both open ends of the container-forming portion at least partially closed, the article is releasably held in said container-forming portion.

4,944,043

TEAM DESIGNATOR BELTS

Janet Bush, 15 Orchard Rd., Castleton, N.Y. 12033

Filed Mar. 28, 1988, Ser. No. 173,885
Int. Cl.[5] A41F 19/00, 15/00
U.S. Cl. 2—308 8 Claims



4. An athletic team indentification belt system comprising:

two belts, each belt having coacting fasteners, one of said fasteners located toward one end of said belt the other fastener located toward the other end of said belt, one of said coating fasteners extending further along the belt than the other fastener, said coacting fastener secured on opposite sides of said belt; and

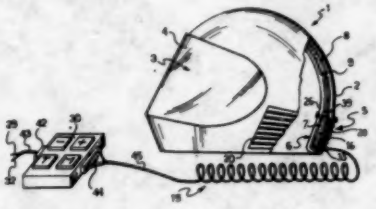
a strip of the same type as one of said coacting fasteners on the inside of each said belt secured on the inside surface substantially equidistant between the ends of said belt whereby one belt may be worn around the waist and the other belt may be worn over the shoulder, said waist belt secured by the coacting fasteners toward either end of the belt and said shoulder belt being secured at one end to the fastener substantially equidistant between the belt ends and the other end of said shoulder belt being secured to one of the coacting fasteners located toward the other end of the waist belts.

4,944,044

PADDING ELEMENT FOR PROTECTION AGAINST SHOCKS, PARTICULARLY FOR A CRASH HELMET

Claudio Zarotti, Milan, Italy, assignor to VELA S.r.l., Milan, Italy

Filed Mar. 14, 1989, Ser. No. 323,592
Claims priority, application Italy, Mar. 14, 1988, 19757 A/88
Int. Cl.[5] A42B 3/02
U.S. Cl. 2—413 18 Claims



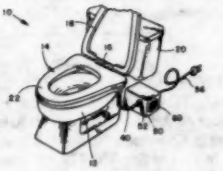
1. A padding element for protection against shocks, particularly useful with a crash helmet, being of a type which comprises at least one deformable vesicle containing a fluid which, in use of the padding element, is in a saturated vapor state, characterized in that it comprises a temperature adjuster means connected to a power supply and associated with said at least one vesicle to vary the vesicle internal pressure by developing or absorbing heat.

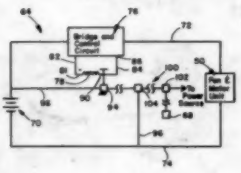
4,944,045

CONDITION-SPECIFIC TOILET VENTILATION SYSTEM

Dionisios Agelatos, and Sortirios Agelatos, both of 3883 Franklin Ave., Seaford, N.Y. 11783

Filed Dec. 7, 1989, Ser. No. 447,546
Int. Cl.[5] E03D 13/00, 9/04; A47K 13/00
U.S. Cl. 4—213 1 Claim





1. A condition-specific toilet ventilation system comprising:

(A) an inlet unit mounted on a bottom surface of a toilet seat, said inlet unit including

(1) a flexible annular hollow housing having a multiplicity of inlet openings defined therethrough, and

(2) a coupling element mounted on said housing;

(B) a flexible hose fluidically connected at an inlet end

thereof to said inlet unit coupling element and having an outlet end;

(C) a fan and motor unit which includes

(1) an inlet fluidically coupled to said flexible hose outlet end, and

(2) an outlet;

(D) a power source;

(E) a control unit mounted in said flexible hose for electrically connecting said fan and motor unit to said power source and including

(1) a Wheatstone bridge circuit which connects said fan and motor unit to said power source when said Wheatstone bridge circuit is unbalanced and which disconnects said fan and motor unit from said power source when said Wheatstone bridge circuit is balanced,

(2) a resistor which will unbalance said Wheatstone bridge circuit when it is connected into said Wheatstone bridge circuit,

(3) a switch unit for connecting said resistor into said Wheatstone bridge circuit when a predetermined quantity of methane gas is present in a bowl of a toilet and for disconnecting said resistor from said Wheatstone bridge circuit when less than said predetermined quantity of methane gas is present in the bowl, said switch unit including

(a) a first line conductor connecting one side of said resistor to said Wheatstone bridge circuit,

(b) a second line conductor connected at one end thereof to said Wheatstone bridge circuit and having a second end spaced from a second side of said resistor,

(c) an electrically conductive element which is movable between a first position electrically connecting said second line conductor second end to said resistor second side to connect said resistor into said Wheatstone bridge circuit and a second position spaced from said second line conductor second end and spaced from said resistor second side to disconnect said resistor from said Wheatstone bridge circuit,

(d) a solenoid connected to said electrically conductive element to move said electrically conductive element into said first position to connect said resistor to said Wheatstone bridge circuit when activated, and to move said electrically conductive element into said second position when deactivated to disconnect said resistor from said Wheatstone bridge circuit when de-activated,

(e) solenoid activating unit for connecting said solenoid to said power source to activate said solenoid when said predetermined quantity of methane gas is present in the bowl of the toilet, said solenoid activating unit including

(i) a chemically sensitive electronic transducer mounted on said inlet unit hollow housing in the bowl of the toilet near a rear section of the toilet, said chemically sensitive electronic transducer generating a signal when sensing menthane gas in said predetermined quantity and failing to generate a signal when sensing methane gas in quantities less than said predetermined quantity,

(ii) a control element connected to said chemically sensitive electronic transducer to adjust the sensitivity of said chemically sensitive electronic transducer, and

(iii) a switch connected to said chemically sensitive electronic transducer to receive said signal therefrom and connected to said solenoid to connect said solenoid to said power source to activate said solenoid when said switch is receiving said signal from said chemically sensitive electronic transducer and disconnecting said solenoid from said power source to de-activate said solenoid when failing to receive said signal from said chemically sensitive electronic transducer.

4,944,046

COVER SHEET APPARATUS FOR TOILET SEAT

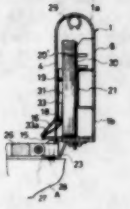
Phil-yool Huh, 1-5-8, Nakamachi, Musashino-shi, Tokyo, Japan, and Yoshihiro Sakurai, 2-4-10, Naki, Shinjuku-ku, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,460

Claims priority, application Japan, Oct. 14, 1987, 62-257249

Int. Cl.[5] A47K *13/14*

U.S. Cl. 4—243 **5 Claims**



1. A cover sheet apparatus for a toilet seat comprising a case having one part thereof arranged to be opened and closed for containing a stack of cover sheets, a fixed member, and an outlet at its lower front portion, said one part of the case including a movable member comprising a top portion having an arch shape in longitudinal section, a front plate having a lower portion with a cutaway portion extending along the widthwise direction, and left and right outer side plates, said case being mounted upright on a rear portion of a toilet, said stack of cover sheets comprising a plurality of cover sheets folded and stacked in a depth direction with a front-positioned cover sheet and a rear-positioned cover sheet in engagement with each other whereby when the front-positioned cover sheet is pulled and taken out of the case through the outlet, the next rear-positioned cover sheet is automatically pulled out through the outlet, a pushing means in said case for resiliently pushing the stack of cover sheets forward at all times, and a pair of horizontal, parallel rotary shafts rotatably mounted in said case forwardly of said pushing means and in engagement with said front-positioned cover sheet so as to ease pulling out of said front-positioned cover sheet.

4,944,047

ROTATING HIDEAWAY SANITARY FIXTURE

Vitaliano Gagliano, Passignano Sul Trasimeno, Italy, assignor to A. T. Avanzata Tecnologia S.R.L., Italy

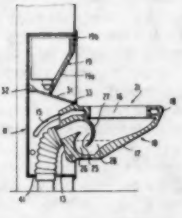
PCT No. PCT/EP87/00406, § 371 Date Mar. 22, 1989, § 102(e) Date Mar. 22, 1989, PCT Pub. No. WO88/00993, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 28, 1987, Ser. No. 328,039

Claims priority, application Italy, Jul. 29, 1986, 22674/86[U]

Int. Cl.[5] E03D *11/12*

U.S. Cl. 4—312 **12 Claims**



1. A sanitary rotating fixture (10, 10a), rotatably mounted in a niche (11) adapted to be set in a structural wall on which the

fixture is fitted, said niche defined by top, bottom, side and back walls and an open front wall, said fixture comprising a flush receptacle substantially triangular in shape when viewed from the side, with a rear wall (13, 13a), an upper portion (21, 21a), sidewalls (16, 16a) and a sloping bottom (17, 17a); said receptacle including flush means in communication therewith through said rear wall for flushing said receptacle; hinge means horizontally disposed between said niche side walls for permitting rotation of said receptacle into and out of said niche open front wall through an angle of less than 90° and preferably an angle of about 60°; and a plastic sheet (31) fixed along one edge thereof to a support (32) secured to the niche back wall and along an opposite edge thereof to a top rear edge (33) of the receptacle, said sheet extending between said niche side walls and being stretched tight when the receptacle is pulled out of said niche to conceal said flush means thereby preventing dirt accumulation thereon, and adapted to fold along the back wall of the niche when the receptacle is inserted in the niche.

4,944,048

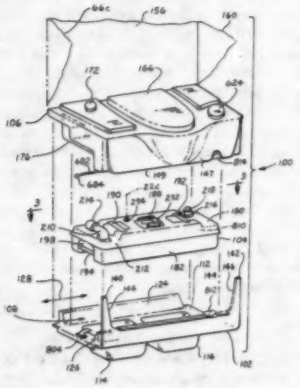
SELF-CONTAINED RV SANITARY SYSTEM

Charles L. Sargent, and John M. Antos, both of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 180,321, Apr. 11, 1988, abandoned, which is a division of Ser. No. 870,800, Jun. 5, 1986, Pat. No. 4,776,631. This application Oct. 25, 1989, Ser. No. 427,030

Int. Cl.[5] E03D *1/00*

U.S. Cl. 4—323 **38 Claims**



1. In a toilet system having a seat section and a tank for water which is used with said seat section, said seat section being supported independently of said tank, the improvement comprising a base which is fixed in a position below said seat section and upon which said tank is supported for separational movement with respect to said seat section from a united position in which said seat section is in fluid communication with said tank enabling water from said seat section to enter said tank to a separated position away from said seat section, said seat section having a lower outlet opening through which said water is discharged from said seat section and said tank having an inlet opening through which said water enters said tank, said seat section outlet opening and said tank inlet opening being vertically aligned with one another in said united position when said tank is in fluid communication with said seat section, retention means for constraining said tank in said united position so as to prevent unintended movement of said tank with respect to said seat section, a valve disposed on said tank which is moveable between positions opening and closing the tank opening, said valve, when in position opening said tank opening, enabling water from said seat section to enter said tank and, when in position closing said tank opening, said valve sealing the contents of said tank within said tank, an operator accessible from said seat section for operating the valve on the tank and coupling means extending from said operator to said valve whereby said valve can be selectively opened by a toilet system user when the tank is in said united position and can be closed when the tank is in said separated position to facilitate tank transport.

4,944,049

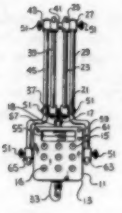
ADJUSTABLE SHOWER HEAD AND CLOCK APPARATUS

Robert Leonard, 7072 Melrose Ave., Apt. A, Buena Park, Calif. 90621

Filed Mar. 6, 1989, Ser. No. 319,099

Int. Cl.[5] B05B *1/00*

U.S. Cl. 4—597 **19 Claims**



1. An improved shower apparatus comprising:

support means for supporting said shower apparatus by a threaded connection to a water pipe;

positioning means, attached to said support means, for multiple positioning of said shower apparatus;

nozzle means for providing a liquid flow pattern;

housing means, pivotally attached to said positioning means, for orientationally supporting said nozzle means;

flow means, connected between said support means and said housing means, for facilitating liquid flow from said support means to said housing means; and, an electronic clock mounted in said housing means.

4,944,050

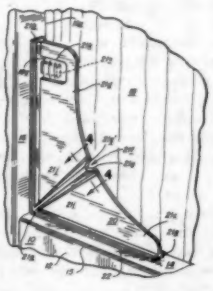
COMBINED SHOWER SPLASH GUARD AND SHOWER CURTAIN HOLDER

Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502

Filed May 26, 1989, Ser. No. 357,125

Int. Cl.[5] A47K *3/22*

U.S. Cl. 4—609 **5 Claims**



1. For use with the existing combination of a shower-equipped tub for a bathroom, in which a person who is showering stands while showering, and where one end of said tub is located adjacent to a generally upright end wall that at least partially bounds the region above the tub; the tub providing a

horizontal upper edge positioned in a substantially vertical plane, and with a flexible shower curtain being provided, suspended from a support spaced above the tub, with said curtain's lowermost end extending downwardly to enter into the confines of the tub, and functioning to limit water splash within the tub from migrating to a region outwardly of the tub;

the improvement of providing a shower splash guard member for limiting water splash from migrating outwardly of the tub to be deposited onto a bathroom floor surface that is located adjacent the tub;

said splash guard member comprising, in combination, a unitary shower splash guard member, that is molded of plastic and is constructed to provide a pair of orthogonally arranged mounting legs that are joined together by a web which is formed integral with, and which extends between, said mounting legs; a first of said mounting legs being adapted to overlie a portion of a horizontal upper edge of the tub wall that is spaced above a bathroom's floor; said splash guard member providing a second mounting leg that projects upwardly relative to said first mounting leg and which is positioned to lie adjacent to, and being adapted to be secured to, said upright end wall;

an opening being provided extending through said web, and being located adjacent to said second mounting leg; a tongue extending from said second mounting leg in a direction away from the second mounting leg and projecting into said opening that extends through said web, said tongue and said opening into which the tongue projects cooperating to provide a means for gripping a portion of a shower curtain, by friction developed between the tongue and the shower curtain and between the web and shower curtain and being operative to hold the shower curtain in a selected position against the web of the splash guard member and against the tongue of the splash guard member.

4,944,051

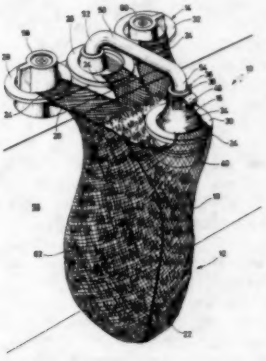
VEGETABLE WASHING ATTACHMENT FOR WATER FAUCETS

Mildred Porter, 2209 East 28th St., Kansas City, Mo. 64109

Filed Dec. 11, 1989, Ser. No. 448,539

Int. Cl.[5] B08B *3/02*

U.S. Cl. 4—638 **4 Claims**



1. A food washing attachment for washing food in a sink with two taps and a faucet having a ledge end and a nozzle end, the washing attachment comprising:

a porous, flexible bag having an upper, open end and a pliant, net-like weave;

at least four rings substantially evenly circumferentially spaced about and operatively coupled with said open end of said bag; and

sprinkler means including a sprinkler member having a connection end, adapted to mate externally with the nozzle end of the faucet, and a lower end including an apertured face for converting a falling stream of liquid into a shower of droplets, said lower end having a greater outer diameter than the inner diameter of said rings, said sprinkler means further including such that when the first of said rings is received on said nozzle end and then slid the length of said faucet to said ledge end, and the second and fourth of said rings are hung on either tap, the third of said rings is selectively placed on the nozzle end, the connection end of said sprinkler member is secured on the nozzle end by said fastening means, and the third of said rings is thus supported by the outer diameter of said lower end of said sprinkler member, so that when food is placed in said bag and the taps are turned on, the food receives a shower of droplets thereon.

4,944,052

PUBLIC SANITARY CUBICLE

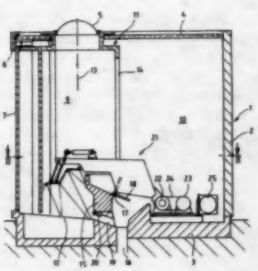
Hans Wall, St. Barbara Strasse 52, D-7517 Waldbronn, Fed. Rep. of Germany

Filed Jul. 28, 1989, Ser. No. 386,127

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1988, 3826847

Int. Cl.[5] E03D *9/00*; A47K *17/00*

U.S. Cl. 4—662 **33 Claims**



1. Public sanitary cubicle comprising a sanitary room, a drain means provided in the sanitary room, a floor means provided in the sanitary room and inclined towards said drain means, a water closet disposed in the sanitary room, door means for providing access to the sanitary room, a technical room subdivided by a partition means and being adapted to accommodate means for supplying, disposal and cleaning of the sanitary room including cleaning means adapted to be brought up to the water closet by a support arm means after moving at least a portion of the partition means, a plurality of spray nozzle means disposed on said support arm means and connected to a pressure water source, wherein at least two of said plurality of spray nozzle means are directed from above in different angular positions onto the water closet, and at least two other spray nozzle means of said plurality of spray nozzle means are directed at least onto the floor means of the sanitary room.

4,944,053

FABRIC DEVICE IN COMBINATION WITH A BED, RESTING SURFACE OR EXAMINING TABLE FOR FACILITATING USER TURNING AND PATIENT EXAMINATIONS

Mary E. Smith, 180 Arlington Ave., Hawthorne, N.J. 07506

Continuation-in-part of Ser. No. 94,331, Sep. 8, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 392,191

Int. Cl.[5] A61G *7/10*

U.S. Cl. 5—61 **10 Claims**

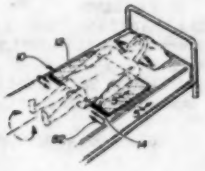
2. In combination with a bed, resting surface, or the like

having a top surface, a combined fabric device useful in facilitating the movement of a person's body while lying on said combined fabric device disposed on said top surface comprising:

(a) a first fabric made from a non-woven, paper thin, soft, pliable, compactable, porous material, said material being permeable to air and water and moisture absorbent, said material characterized in that it is non-irritating to the person's skin after laying on same for a prolonged period of time;

(b) a second fabric made from a material which is relatively frictionless such that it moves relatively easily on itself;

(c) means fixedly securing said first fabric to said second fabric to form a first subassembly having a first and second end; and



(d) means connecting said first end to said second end to form a closed loop of said first subassembly such that said second fabric is on the interior side of said closed loop whereupon it can slide on itself, said closed loop of said first subassembly having a width approximately equal to the width of the bed and having a length approximately extending the distance between the person's mid-back and thighs, said fabric device when interposed between a person and said top surface upon which he reclines and when disposed between that person's thighs and mid-back, facilitating that person's ability to turn and move under his own power without the aid of a second person, the person's comfort not disturbed by laying thereon for a prolonged period of time, even though the fabric device may be bunched beneath him, due in part to the non-woven, paper thin, soft, pliable, porous, air and water permeable, moisture absorbent material comprising said first fabric.

4,944,054

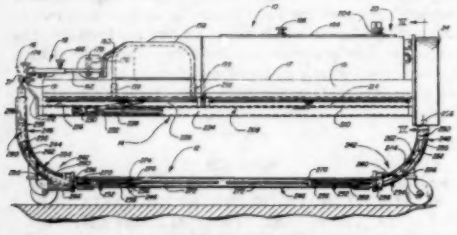
THERAPEUTIC TABLE

Clayton E. Bossert, Aurora, Ill., assignor to Thomas J. Ring, Palos Heights, Ill.

Filed Jan. 29, 1988, Ser. No. 149,432

Int. Cl.[5] A61H 1/00

U.S. Cl. 5—61 **12 Claims**



1. In a therapeutic table having a frame and a patient support rotably mounted to the frame, a motor for providing power to rotate the patient support relative to the frame, an improved drive control assembly, comprising:

means for disengaging the motor from the patient support to remove rotary power therefrom and stop movement of the patient support;

means, for locking the patient support in a horizontal position when actuated; and

means associated with the disengaging means for automatically actuating the locking means when the motor is disengaged.

4,944,055

BED WHICH IS CONVERTIBLE INTO EASY CHAIR

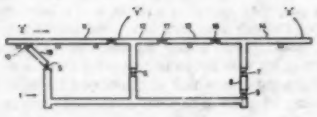
Oded Shainfeld, 20 Rehov Kehilat Budapest, Tel Aviv, Israel

Filed Jan. 9, 1989, Ser. No. 294,357

Claims priority, application Israel, Feb. 17, 1988, 85442

Int. Cl.[5] A61G 7/05

U.S. Cl. 5—68 **2 Claims**



1. A piece of furniture comprising:

a chassis (1) having first, second and third spaced apart contact portions;

a first arm (19) pivotally mounted to said first contact portion at a first hinge (5);

a second arm (8) having one end pivotally mounted to said third contact portion at a second hinge (9), said second arm having an opposite end;

a upper-structure connected at a plurality of hinges to said first and second arms and to said second contact portion, said upper-structure comprising a back support (14) having opposite ends, said back support having a T-shaped elevation with a cross piece for supporting a mattress and a post rigidly connected to said cross piece, said post of said back support being pivotally connected directly to said opposite end of second arm at a third hinge (7) located intermediate said opposite ends of said back support, and said back support being connected to said chassis only by said third hinge, a seat (13) having one end connected only at a fourth hinge (18) to one end of said back support, said seat having an opposite end, a first leg support (12) having one end connected only at a fifth hinge (17) to said opposite end of said seat, said first leg support having an opposite end and having a T-shaped elevation with a cross piece for supporting a mattress and a post rigidly connected to said cross piece of said first leg support, said post of said first leg support being directly pivotally connected at a sixth hinge (6) to said second contact portion and at an intermediate location on said first leg support between said one end and said opposite end of said first leg support, said seat being connected only to said back support and said first leg support, and a second leg support (11) having one end pivotally connected at a seventh hinge to said opposite end of said first leg support, said second leg support having an opposite end and being pivotally connected to said first arm at an eighth hinge (10) and at a location intermediate said one end and said opposite end of said second leg support; and

at least some of said hinges being lockable for locking a relative position between said first and second arms and between said back support, said seat, and said first and second leg supports;

said back support, said seat, and said first and second leg supports each comprising a frame defining a concave space for receiving a single mattress spanning said back support, said seat, and said first and second leg supports, each of said fourth, fifth and seventh hinges being connected at upper edges of said frames forming said respective back support, seat and first and second leg supports.

4,944,056

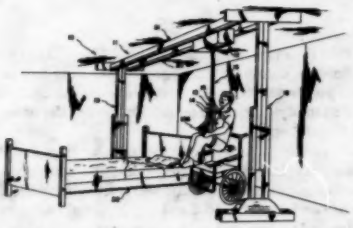
METHOD AND APPARATUS FOR TRANSPORTING A DISABLED PERSON

Roger A. Schroeder, Tonawanda, N.Y.; Robert H. Broyden, Bristol, Va.; Robert C. Dearstyne, Amherst, N.Y.; Joseph L. Magner, Piney Flats, Tenn.; Randall J. Gephart; David W. Dayton, both of Abingdon, Va., and Raymond A. Newman, Cheektowaga, N.Y., assignors to The Research Foundation of State University of NY, Albany, N.Y.

Filed Sep. 28, 1988, Ser. No. 250,335

Int. Cl.[5] A61G *7/10*

U.S. Cl. 5—81 R **23 Claims**



9. Apparatus for transporting a disabled person in a carrying means, comprising:

support means adapted to engage both a ceiling and a floor;

hoist means secured to said support means for raising and lowering the carrying means; and

safety means to sense a malfunction in said hoist means, and to provide a controlled rate of descent of said hoist in response to said malfunction.

4,944,057

PATIENT SUPPORT AND LIFTING DEVICE

Karen Shaw, R.D. #2, Oxford, N.Y. 13830

Filed Sep. 28, 1989, Ser. No. 413,709

Int. Cl.[5] A61G *1/00*

U.S. Cl. 5—89 **8 Claims**

1. A sling-type device for assisting an individual in lifting a handicapped or infirm person from a seated position on a first supporting surface and transferring the person to a sitting position on a second supporting surface, said device comprising:

(a) a main body portion of flexible material having front, rear and right and left side edges;

(b) said material being folded inwardly to form a double layer, and attached to itself in marginal portions along each of said right and left side edges;

(c) a first pair of longitudinally elongated and spaced pockets, each open at both ends, in said double layer, marginal portions along said right side edge;

(d) a second pair of longitudinally elongated and spaced pockets, each open at both ends, in said double layers marginal portions along said left side edge; and

(e) first and second elongated, continuous loops of flexible material respectively passing through said first and second pair of pockets, whereby portions of each of said loops are accessible in a space between said longitudinally spaced pockets, said loops providing strap-type handle means adjacent each of said side edges for selective use either in the full length of said loops or in shortened length by drawing said portions of each of said loops through said pockets and doubling said loops upon themselves.

4,944,058

INTEGRATED MATTRESS AND FLUSH COMMODE

Monte Carnahan, and Gayle A. Carnahan, both of 100 W. Cedar, Wilburton, Okla. 74578

Filed Nov. 20, 1989, Ser. No. 439,849

Int. Cl.[5] A61G *7/02*

U.S. Cl. 5—90 **12 Claims**

1. A bed with an integrated flush commode, comprising:

a mattress and bed frame with a hole disposed therethrough to receive the upper portion of the flush commode such that the upper surface of the flush commode is proximate to the same plane as the upper surface of the mattress, the hole approximately the same size as the outer peripheral edge of the flush commode on the upper end thereof;

a sanitary insert disposed about the upper lip of the bowl of the flush commode, said sanitary insert having:

a flat surface disposed on the surface of said mattress and about the hole therein and extending from points distal to the rim of the flush commode bowl to the interior of the rear edge of the flush commode bowl,

a downwardly extending surface being cylindrical in shape and extending from the interior edge of the rim of the flush commode bowl and downward into the flush commode bowl on the interior surface thereof, and

means for attaching said flat surface to the surface of said bed on the outer peripheral edges of the flat surface; and

a commode seat configured to fit over the rim of the flush commode bowl and overlying the portion of said sanitary insert disposed over the rim of the flush commode bowl; and

a splash guard configured as a cylindrically shaped semi-rigid surface having the peripheral edges on one end thereof attached to the inner peripheral edge of said commode seat, the surface of said splash guard extending downward into said flush commode bowl.

4,944,059

PRENATAL BODY SUPPORT

Carole Wall, Lake Arrowhead, Calif., assignor to Abby Brooks Corporation, Lake Arrowhead, Calif.

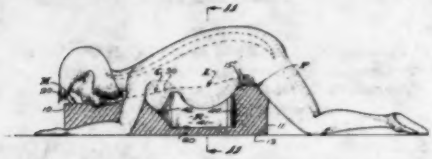
Filed Sep. 27, 1989, Ser. No. 413,999

Int. Cl.[5] A47C *27/00, 27/08*

U.S. Cl. 5—431 **15 Claims**

1. A prenatal body support adapted to support a pregnant female in a prone position with her lower back arched upwardly, with the head and knees supported in a lowered position relative to her lower back, said support comprising an elongate, soft, resilient load supporting body with longitudinally spaced front and rear ends, laterally spaced outer sides, a flat downwardly disposed bottom and an upwardly disposed top surface, the top surface having an upper rear pelvic support portion extending longitudinally and transverse the rear end portion of the body, a forward head support portion ex-

tending longitudinally and transversely of the front end portion of the body on a plane spaced below the plane of said pelvic support portion, a pair of laterally spaced longitudinally extending lateral-anterior abdominal support portions extending forward from said pelvic support portion, a longitudinally



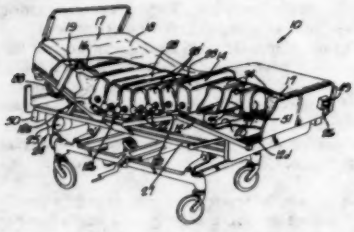
and transversely extending chest support portion between said head support portion and said abdominal support portions, and an upwardly opening abdomen receiving recess, the open top of said recess being defined by said pelvic, chest and abdomen support portions.

4,944,060

MATTRESS ASSEMBLY FOR THE PREVENTION AND TREATMENT OF DECUBITUS ULCERS

John R. Peery, 2170 Princeton St., Palo Alto, Calif. 94306; Michael N. Gold, 6222 Mammoth Ave., Van Nuys, Calif. 91401; Saadia M. Schorr, 3390 Vista Haven Rd., Sherman Oaks, Calif. 91403, and Jack Gorby, 525 N. Bellagio Ter., Los Angeles, Calif. 90049

Filed Mar. 3, 1989, Ser. No. 318,733
Int. Cl.[5] A47C 7/057, 27/10
U.S. Cl. 5—453 **45 Claims**



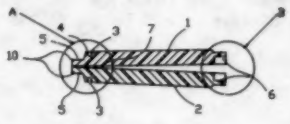
1. A mattress assembly for the treatment and prevention decubitus ulcers and for the treatment of other conditions of the skin and/or underlying tissue, said assembly comprising: a mattress core defining a plurality of discrete, air permeable air cells; a pair of lateral bolsters disposed adjacent opposite sides of said mattress core; a top sheet disposed over said core and said bolsters for defining a planar support surface for a person resting thereon, said sheet being formed of a blend of elastomeric and water wicking fibers to render said sheet air and liquid permeable, highly elastic, of low friction, and water wicking so as to conform readily to the irregularities in the topography of the body of a person resting thereon without wrinkling, and draw moisture away from the skin; air supply means for providing air flow to and through said cells and said sheet to inflate said cells for supporting a person thereon and maintaining the skin of a person thereon in a properly hydrated condition; and means for controlling the air pressure within said cells to maintain the contact pressure of the mattress assembly against the skin of a person thereon at a desired level.

4,944,061

TOOL FOR UNCOUPLING INTERLOCKING BLOCKS

Daniel A. Woodward, 807 Briarwood Dr., West Palm Beach, Fla. 33415

Filed Jan. 24, 1990, Ser. No. 469,341
Int. Cl.[5] B24F 1/00
U.S. Cl. 7—170 **9 Claims**



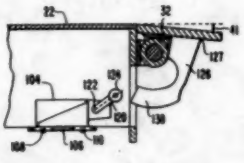
1. A tool for uncoupling interlocking blocks, comprising:
two elongate members, each member forming half of a tool;
a semicylindrical recess formed at one end of each member and a semicylindrical extension formed at the other end of each member;
pivotal means pivotally connecting the two members in apposition, intermediate said ends, the recesses and the extensions being in apposition to form a cylindrical recess at the one end of the tool and a cylindrical extension at the other end of the tool, said pivotal means forming a small clearance between the two members;
retaining means resiliently holding the two members in apposition, the retaining means being positioned between the pivotal means and the cylindrical extension.

4,944,062

DOCK LEVELER CONTROL SYSTEM

Edward T. Walker, Little Rock, Ark., assignor to Dock Leveler Manufacturing, Inc., Malvern, Ark.

Filed Dec. 15, 1987, Ser. No. 133,081
Int. Cl.[5] E01D 1/00
U.S. Cl. 14—71.3 **18 Claims**



1. A dock leveler for bridging a gap between a loading dock platform and a carrier bed, comprising:
a frame having a first end to be disposed adjacent a loading dock platform and a second opposite end spaced outwardly from said first end;
a main deck having first and second opposite edges, said first edge pivotably connected to said first end of said frame for pivoting said main deck relative to the plane of the loading dock platform for positioning said second edge of said main deck at a selected height relative to the loading dock platform;
a lip member having first and second opposite edges, said first edge of said lip member pivotably connected to said second edge of said main deck for pivoting said lip member between a first angular position relative to said main deck for engaging the carrier bed, second angular position relative to said main deck, and a third angular position relative to said main deck for supporting said main deck at a selected level relative to the loading dock platform, said second angular position being intermediate said first and third angular positions;
hydraulic operating means for pivotably positioning said main deck relative to the loading dock platform and for

pivoting said lip member between said first and third angular positions; and

a control system including switch means responsive to the position of said lip member for activating said operating means to pivot said main deck and to move said lip member to said third angular position, and for de-activating said operating means when said lip member is in said third angular position for supporting the second edge of the main deck at a selected level relative to the adjacent loading dock platform;

said switch means including a switch operable to a first condition for activating the hydraulic operating means and operable to a second condition for de-activating said hydraulic operating means; and wherein the control system further includes cam means configured for moving said switch to said first condition upon the pivoting of said lip member from said first angular position to said second angular position and for moving said switch to said second condition when said lip member is in said third angular position.

4,944,063

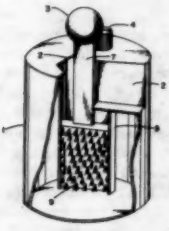
GOLF CLUB WASHER

Johnny Jordan, 1004 S. Eric, Monahans, Tex. 79756

Filed May 1, 1989, Ser. No. 306,918

Int. Cl.[5] A63B *57/00*

U.S. Cl. 15—104.92 **4 Claims**



1. Apparatus for washing the face of a golf club comprising an upwardly opening container for holding a solution of water and soap;

a closure member for said container, a slot opening where an iron golf club is held in captured relationship respective to said container, a wash brush having a handle opposed to a brush, means reciprocatingly mounting said wash brush within the container with the brush contacting the face of the golf club and the brush handle extending from the top of the container;

whereby a golf club can be placed in said slot with the golf club face contacting the brush, the brush is reciprocated to wash the golf club face.

4,944,064

WIPER BLADE WITH RETENTION MEANS

Jose Verton, Saint-Vincent, Belgium, assignor to Champion Spark Plug Europe S.A., Belgium

Filed Dec. 21, 1988, Ser. No. 288,286

Claims priority, application United Kingdom, Feb. 1, 1988, 8802154

Int. Cl.[5] B60S *1/38*

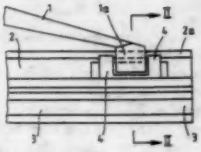
U.S. Cl. 15—250.42 **9 Claims**

1. A wiper blade for motor vehicles or the like comprising a superstructure (1) provided with at least one claw (1*a*) capable of gripping a longitudinally extending pressure distributing rod (2), a wiping element (3) partially located in the pressure distributing rod (2) and retention means (4) capable of retaining the claw (1*a*) of the superstructure (1) of the wiper blade on the pressure distributing rod (2) and on the wiping element (3), characterized in that:

(a) the pressure distributing rod (2) is locally provided, on its bottom portion, with one single longitudinally extending recess (2*b*),

(b) the wiping element (3) is locally provided, on its top portion, with a longitudinally extending recess (3*b*) having substantially the same dimensions as the recess (2*b*) in the pressure distributing rod (2),

(c) said two recesses (2*b*, 3*b*) define one single transverse opening (5) in the assembly pressure distributing rod/writing element (2, 3),



(d) said single transverse opening (5) extends longitudinally through the claw (1*a*) of said superstructure (1),

(e) the retention means (4) is located in said single transverse opening and has the form of a substantially rectangular element capable of embracing separately each of the two legs of the claw (1*a*) of the superstructure (1), and

(f) said substantially rectangular retention means (4) located in said single transverse opening is provided on each lateral side of the pressure distributing rod (2) with at least one upwardly projecting stop means (4*b*).

4,944,065

SUCTION CLEANER

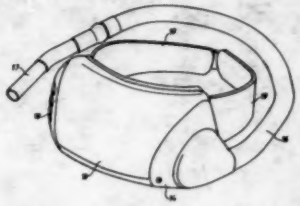
Joakim A. Svanberg, Johanneshov; Lars G. Kilstrom, Täby; Lars G. Tuvin, Knivsta, and Anders E. C. Larsson, Stockholm, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Aug. 28, 1989, Ser. No. 399,315

Claims priority, application Sweden, Sep. 27, 1988, 8803420

Int. Cl.[5] A47L *5/36*

U.S. Cl. 15—327 C **3 Claims**

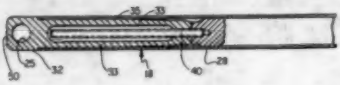


1. Suction cleaner comprising a housing (10) with a filter bag (11) and a suction fan (12) driven by a motor (13), wherein the housing (10) is provided with a carrier belt (19) adapted to be applied around the waist or hips of the user, and that the housing (10) comprises a concave supporting surface (20) adapted to conform to the figure of the user.

4,944,066
ADJUSTABLE CLOSER ARM

Zakhary Fayngersh, West Hartford; Ronald S. Slusarski, Berlin, and Richard W. Schumacher, Newington, all of Conn., assignors to Emhart Industries, Inc., Towson, Md.

Filed Feb. 14, 1989, Ser. No. 310,799
Int. Cl.[5] E05F *1/00*
U.S. Cl. 16—49 6 Claims

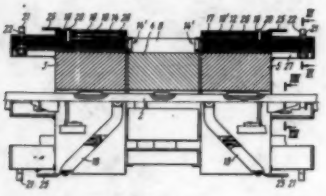


1. An arm for a door closer having a shaft rotatable about a first axis, said arm comprising:
a first arm member having a first end connected to said shaft and rotatable therewith;
a second arm member having a first end pivotably connected to a second end of the first arm member and a second end pivotably connected to a mounting bracket, said second arm member comprising:
an open ended axially movable housing member having radially inwardly extending detent means,
clamp means fully contained within said housing member and having a first end forming the first end of said second arm member and a second end forming radially expandable jaws, said housing detent means when in a first axial position maintains the jaws in a closed position and when in a second axial position permits the jaws to radially expand while fully contained within said housing member,
a link having a first end forming the second end of said second arm member and a second end, and
a joining member connected to the second end of said link and extending towards said clamp means, said joining means being held in a fixed position by said jaws when the jaws are closed and being axially movable relative to said clamp means when the jaws are radially expanded.

4,944,067
APPARATUS FOR BONING HAMS OF POULTRY CARCASSES

Boris V. Kulishev, Solnechnogorsky raion, p/o Rzhavki, 16, kv. 83; Yakov M. Petlakh, Solnechnogorsky raion, p/o Rzhavki, 16, kv. 98, and Boris V. Elizarov, Klinsky raion, p/o Vozdvizhenskoe, 5, kv. 44, all of, Moskovskaya oblast, U.S.S.R.

Filed Jan. 31, 1989, Ser. No. 304,229
Claims priority, application U.S.S.R., Oct. 3, 1988, 4485536[1]
Int. Cl.[5] A22C *21/00*
U.S. Cl. 17—11 7 Claims

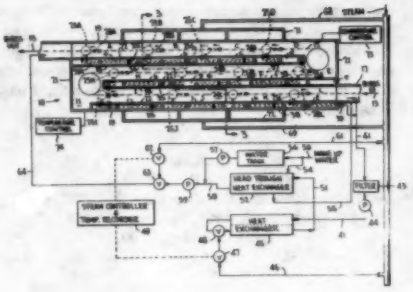


1. Apparatus for boning hams of poultry carcasses, comprising:
means for engaging a ham, said means being made in the form of at least a pair of coaxially positioned first and second cylinders having interior spaces for receiving ham bones and a loading trough partly surrounding said cylinders when said cylinders are in a ham processing zone;
said cylinders being mounted for relative reciprocation; and
a cutting tool, said cutting tool comprising a hollow cylinder having an end cutting edge and coaxially mounted on one of said first and second cylinders for reciprocation in the trough with respect to said first and second cylinders.

4,944,068
POULTRY SCALDER, SCALDING SYSTEM AND PROCESS

Edward H. Covell, III, 919 Riverside Dr., Salisbury, Md. 21801

Filed Oct. 27, 1989, Ser. No. 427,484
Int. Cl.[5] A22C *21/04*
U.S. Cl. 17—11.2 23 Claims



1. A poultry scalding system comprising, an open immersion tank adapted to contain scalding liquid at a predetermined scald temperature, conveyor means positioned above said, tank for moving poultry in one direction through said tank from an entrance station, through at least one intermediate station and to an exit station at said tank while the poultry is immersed in the liquid as the poultry hangs by the legs from said conveyor means, liquid recirculating means connected to said tank for recirculating the liquid in a direction opposite said one direction during operation of said conveyor means by removing the liquid at said entrance station and returning a quantity of liquid to said tank at said exit station, means for replenishing any loss of liquid from said tank, said recirculating means including means external to said tank for counterflowing the liquid in stages from said exit station through said intermediate station and to said entrance station in said opposite direction, means for filtering the liquid removed at said entrance location, and means for heating the replenished liquid to said scalding temperature before being returned to said tank.

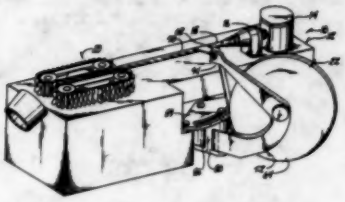
4,944,069
ENCASED PRODUCT AND METHOD AND APPARATUS FOR ENCASING SAME

Ray T. Townsend, Des Moines; David W. Smith, West Des Moines, and Robert M. Dykes, Urbandale, all of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed Apr. 28, 1988, Ser. No. 187,351
Int. Cl.[5] A22C *21/00*
U.S. Cl. 17—49 5 Claims

1. An apparatus for encasing a plastic product, comprising:
a support;
an elongated casing strip having opposite side edges;
first means on said support for forming said strip into a plurality of helical revolutions with said side edge of said strip within each one of said helical revolutions frictionally engaging and overlapping said side edges of said strip within those of said helical revolutions adjacent said one helical revolution so as to form an elongated tubular casing;
second means on said support for introducing said plastic product into said casing,
said overlapped edges of said casing strip being sufficiently

damp from the presence of water-based moisture and being sufficiently overlapped to create enough frictional cohesiveness to maintain said helical revolutions in a self-contained tubular casing to contain said plastic product.



4,944,070

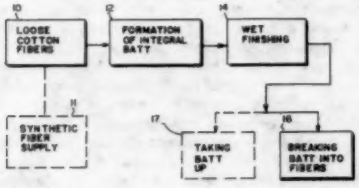
CONTINUOUS COTTON WET FINISHING

Lawrence Girard, and E. Walter Meyer, both of Greenville, S.C., assignors to Greenville Machinery Corporation, Greer, S.C.

Filed Mar. 23, 1989, Ser. No. 327,601

Int. Cl.[5] D06B *1/00, 3/00*

U.S. Cl. 19—66 CC **20 Claims**



1. A method of wet finishing cotton fibers, comprising the steps of continuously, sequentially:

(a) forming a plurality of loose cotton fibers into an integral batt composed at least primarily of cotton fibers, having sufficient integrity to withstand further wet processing, yet remaining easily transformed back into loose fibers;

(b) wet finishing the integral batt including washing thereof; and

(c) breaking the integral batt back into wet-finished loose cotton fibers.

4,944,071

TEXTILE FIBRE BALE BREAKER

Pietro B. Marzoli, and Mario Mascheretti, both of Via Durante, 1, Palazzolo sull'Oglio (BS), Italy

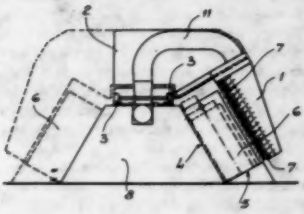
Filed Oct. 25, 1989, Ser. No. 426,785

Claims priority, application Italy, Jun. 1, 1989, 20724 A/89

Int. Cl.[5] D01G *7/12*

U.S. Cl. 19—80 R **5 Claims**

1. A bale breaker so designed and arranged as to remove textile fibres from a textile fibre bale in a direction perpendicular to laps of said bale, said bale breaker comprising a movable carriage sliding along a bearing frame of trapezoidal cross-section and supporting a plurality of slanted bales, said movable carriage being driven for moving along outer faces of said bales and carrying a fibre removing carriage having a longitudinal axis which is perpendicular to said bale laps.



4,944,072

PROFILED FASTENERS

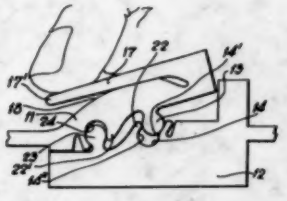
Peter M. Robson, Les Anguettes, Clos du Port, La Rocque, Grouville, Jersey C.I, Great Britain

Filed Jun. 20, 1989, Ser. No. 368,775

Claims priority, application United Kingdom, Jun. 25, 1988, 8815164; Nov. 8, 1988, 8826131

Int. Cl.[5] B65D *33/16*

U.S. Cl. 24—587 **23 Claims**



1. A profiled bead and recess fastener comprising mating, complementary parts of which one part has a recess and the other part has a bead which engages in the recess to maintain the fastener closed against tension forces so directed as to tend to separate the two parts, the recess having in cross section, an entrance for the bead, which is smaller in cross section than the bead cross section whereby to retain the bead in the recess, the cross section of said entrance being adjustable by local elastic deformation to permit the bead to enter or leave the recess laterally, such local deformation to permit the bead to leave the recess being caused by flexure of one side of the recess by the bead whilst the bead comes out of contact with the other side of the recess without applying tension forces between the two parts.

4,944,073

PLUG FASTENER

Reinhold Haug, Königsbach-Stein, Fed. Rep. of Germany, assignor to J. Kohle GmbH & Co. KG, Pforzheim, Fed. Rep. of Germany

Filed Nov. 15, 1989, Ser. No. 437,849

Int. Cl.[5] A44B *13/00*; A44C *11/02*

U.S. Cl. 24—590 **13 Claims**

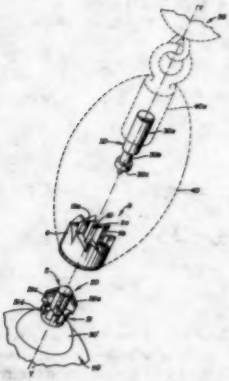
1. In a plug fastener for an ornamental band having two ends, comprising

a socket, which has a rear end and is adapted to be connected at said rear end to one end of said ornamental band and has an inside peripheral surface, which has an inner end axially spaced from said rear end of said socket and is formed with angularly spaced apart first axial grooves having a

relatively large depth and with second axial grooves having a relatively small depth and disposed each between two adjacent ones of said first grooves, said socket being formed between said inner end of said inside peripheral surface and said rear end of said socket with an internal gear having teeth with taper toward said rear end of said socket and each of which has an inclined tooth face,

spring means, which are mounted in said socket between said inner end of said inside peripheral surfaces and said rear end of said socket and comprise an axially movable stem, which faces said gear, and spring means urging said stem toward said gear, and

a plug, which is adapted to be connected at one end to the other end of said ornamental band and which comprises a driving sleeve having a forward end, a central bore, which is open at said forward end, an outside peripheral surface formed with angularly spaced apart axial ribs, and at said forward end with angularly spaced apart teeth, each of which has an axially protruding crest, said plug also comprising a generally cylindrical head piece, which protrudes from said forward end of said sleeve and is rotatably mounted in said bore and is axially coupled to said sleeve with lost motion and has an outside peripheral surface formed with angularly spaced apart axial ribs having beveled rear end faces facing said sleeve,



wherein said plug is adapted to be inserted into said socket to move said ribs of said head piece through said first axial grooves and beyond said gear until said head piece is disposed between said gear and said stem and into axial engagement with said stem to axially depress the same,

said beveled rear faces of said ribs of said head piece are adapted to cooperate with said inclined tooth faces of said gear and with said teeth of said sleeve to impart a rotation to said head piece,

said head piece is adapted to assume in said socket between said gear and said stem at least one first angular position, in which said ribs of said head piece are axially aligned with said first axial grooves, and at least one second angular position, in which said ribs of said head piece are axially aligned with said second axial grooves,

the depth of said first axial grooves is sufficient to permit said ribs of said sleeve and said ribs of said head piece to axially enter said first axial grooves,

the depth of said second axial grooves is sufficient to permit said ribs of said sleeve to axially enter said second axial grooves and is insufficient to permit said ribs of said head piece to axially enter said second axial grooves, and

stop means are provided for limiting the movement of said plug in said socket toward said rear end of said socket in a position in which said stem is axially depressed by said head piece.

4,944,074

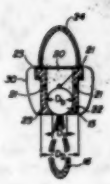
PRESET RESTRAINING DEVICE

David M. Bullat, Carlsbad, and Willie L. Thomas, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 15, 1989, Ser. No. 327,856

Int. Cl.[5] A44B 11/25

U.S. Cl. 24—682 **3 Claims**



1. An apparatus for releasing a member thereof when subjected to a predetermined tensile force comprising:

a round-shaped member and

a retaining member fabricated from a flexible material and having a cylindrical shell-shaped housing provided with an axial bore sized to slidable receive said round-shaped member therein, a lip radially extending inwardly in said axial bore at one end of said cylindrical shell-shaped housing being sized to retain said round-shaped member therein and at least one slit extending part of the length of said cylindrical shell-shaped housing, said at least one slit permitting flexure of a portion of said cylindrical shell-shaped housing to bend and remove said lip out of said axial bore to thereby release said round-shaped member when said predetermined tensile force is exerted between said round-shaped member and said retaining member, said round-shaped member is a rigid ball having an interconnected loop and said cylindrical shell-shaped housing of said retaining member is further provided with a U-shaped member and is provided with a plurality of slits each parallel with one another and each partially extending the length of said cylindrical shell-shaped housing, in which the materials, numbers of slits and dimensions of said cylindrical shell-shaped housing are chosen to assure the proper selective said predetermined tensile force in accordance with the relationships:

$$I=R_2t(\alpha+\sin\alpha^{\circ}\cos\alpha^{\circ})=2\sin^2\alpha^{\circ}$$

$$P=3EI\Delta x/L_1^3$$

$$\Delta_x=(D_b-D_f)/2$$

where:

E=modulus of Elasticity of the cylindrical housing, I=moment of Inertia, Δ_x=maximum deflection, L_1=length of slit, $\alpha=\frac{1}{2}$ angle in radians between slits, $\alpha^{\circ}=\frac{1}{2}$ angle the radial angle between slits expressed in degrees, P=load on each leg (total load at release divided by number of legs), $R_2=D_2/2$, t=thickness of cylindrical housing wall, D_b=diameter of ball, D_f=minimum cylindrical housing diameter and D_2=outside cylindrical housing diameter.

4,944,375

DETRIMENTAL-SUBSTANCE-CONTAINING THEFT-DETERRENT DEVICE

Dennis L. Hogan, St. Petersburg, Fla., assignor to Security Tag Systems, Inc., St. Petersburg, Fla.

Filed Sep. 18, 1989, Ser. No. 408,618

Int. Cl.[5] A44B 9/00

U.S. Cl. 24—704.1 **13 Claims**

1. A device for deterring theft of a protected article, comprising

means for attaching the device to the article, with said at-

taching means being embodied in two components that are adapted to be locked together on opposite sides of a portion of said article to prevent unauthorized removal of the device from the article, wherein the attaching means include a pin having a head that is anchored within one component and a clutch contained in the other component for grasping the pin to provide a predetermined retaining force for resisting separation of the components by prying or pulling the components apart;

wherein said one component includes at least one fragile elongated vial that fractures when at least a predetermined pressure is applied thereto, with said vial containing a detrimental substance that would damage the article if the vial were to be fractured while the device was attached to the article; and

wherein said one component defines a head space for enabling limited axial movement of the pinhead, and a guide

channel for containing a movable object between the pinhead and the vial; and

a movable object disposed in said guide channel, with said movable object exerting little or no pressure between the vial and the pinhead while the attaching means is in a relaxed state, which occurs when no force is being applied to separate the two components;

wherein the guide channel is contoured for enabling the pinhead to force the movable object to move and apply more than said predetermined pressure against the vial in response to the pinhead being moved in response to application to the two components of at least a predetermined threshold separation force that is nevertheless less than that required to overcome said predetermined retaining force, to thereby fracture the vial to release the substance contained therein before the components are separated by prying or pulling the components apart.

4,944,076

CORRUGATED FIBERBOARD CASKET LIDS

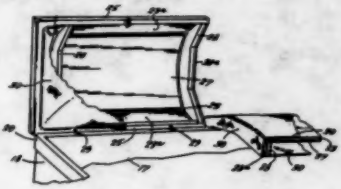
William M. Kay, Boyertown, Pa., and Bruce E. Elder, Royal Oak, Mich., assignors to Boyertown Casket Company, Boyertown, Pa. and Vandor Corporation, Rochester, Mich.

Continuation of Ser. No. 654,981, Sep. 27, 1984, abandoned. This application May 13, 1987, Ser. No. 54,129

Int. Cl.[5] A61G *17/00*

U.S. Cl. 27—14 **4 Claims**

1. A lid for closure of the base or shell of a casket, the principal closure area of the lid consisting of first and second laminated corrugated fiberboard layers, the first of said laminated fiberboard layers being formed as a unitary panel, extending substantially throughout the length and width of the lid from a flat sheet of single-wall fiberboard and comprising an elongated central area and bevelled edge portions at both the side and end edges of the lid, said unitary panel consisting of a single corrugated sheet with an uncorrugated sheet at each side of the corrugated sheet, the axes of the corrugations of said single corrugated sheet being extended transversely of the longitudinal axis of the lid, said unitary panel further having its central region progressively increased in height both laterally and longitudinally thereby providing a central domed area between the bevelled edges both laterally and longitudinally of the lid, frame structure connected with said unitary panel on the inner side thereof, the frame structure including a plurality of longitudinally spaced transversely extending bridges each having inclined portions engaged with the bevelled side edge portions of the lid and each further having an upwardly curved surface engaged with the central domed area of the lid, and the frame structure including marginal framing elements interconnected with the side and end edges of said unitary panel, the transversely extending bridges being formed of multiple wall corrugated fiberboard having a plurality of corrugated sheets



each having planar sheets at each side of each corrugated sheet and with the axes of the corrugations vertically aligned relative to the inner surface of the lid and thus also substantially perpendicularly to the axes of the corrugations of said first fiberboard layer of the lid, and said second layer of the principal closure area of the lid being formed of separate partial panels each lying at the underside of the unitary panel of the first layer in an area thereof between spaced bridges of the framing structure, the side edges of said partial panels being terminated inboard of the bevelled side edges of the first layer, each of said partial panels consisting of a single corrugated sheet and a single uncorrugated sheet, and the corrugated sheet of each partial panel being adhesively bonded to the unitary panel of the first layer and with the axes of the corrugations extended longitudinally of the lid and transversely of the axes of the corrugations of said first layer.

4,944,077

WINDING MACHINE WITH REDUCED YARN RUN RESISTANCE AND METHOD OF REDUCING THE YARN RUN RESISTANCE

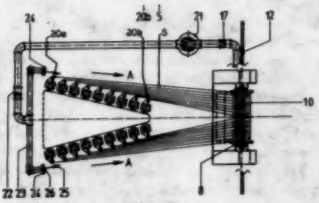
Manfred Bollen, Oberuzwil, Switzerland, assignor to Benninger AG, Uzwil, Switzerland

Filed Jan. 25, 1989, Ser. No. 301,479

Claims priority, application Switzerland, Feb. 5, 1988, 417/88

Int. Cl.[5] D02H *13/22*; D02J *7/00*; B65H *49/00*

U.S. Cl. 28—173 **9 Claims**



1. A winding machine comprising a plurality of yarn bobbins each mounted for rotation about its own fixed individual axis,

a beam mounted for rotation about a fixed axis located at a substantial distance from each said bobbin axis and arranged to wind thereon an array of yarns while withdrawing said array from said bobbins through an ambient atmosphere of air, and an arrangement for reducing air resistance to the passage of the yarns by accelerating the air velocity sufficiently to substantially reduce the air resistance of the yarn run in the region surrounding said array of yarns, at least partially between the bobbins and the beam and substantially in the yarn run direction toward said beam.

4,944,078

SIZE VISCOSITY CONTROL METHOD AND CONTROLLER FOR SLASHERS

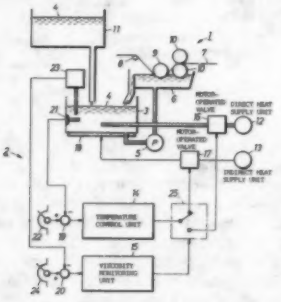
Kiyoshi Nakade, Komatsu, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Jun. 9, 1989, Ser. No. 363,989

Claims priority, application Japan, Jun. 20, 1988, 63-152031; Jul. 5, 1988, 63-165902; Oct. 6, 1988, 63-252557

Int. Cl.[5] D06B *3/18*

U.S. Cl. 28—183 **10 Claims**



1. A method of controlling the viscosity of size for a slasher, employing a temperature control unit for maintaining the temperature of the size at a desired temperature, a direct heat supply unit for supplying wet heat containing water to the size, and an indirect heat supply unit for supplying dry heat to the size; characterized in that the heat supply ratio between the direct heat supply unit and the indirect heat supply unit is regulated on the basis of the deviation of the actual viscosity of the size measured by a viscosity detector from a predetermined desired viscosity so that the deviation is decreased.

4,944,079

MACHINE FOR CONNECTING AN END OF AN OPTICAL FIBER CABLE TO AN OPTICAL FIBER CONNECTOR

Kunio Nakamura, Tokyo, and Minoru Abe, Kawasaki, both of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 25, 1988, Ser. No. 160,214

Claims priority, application Japan, Mar. 5, 1987, 62-51178

Int. Cl.[5] H01R *43/00*

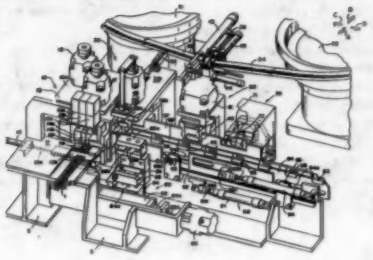
U.S. Cl. 29—33 M **8 Claims**

1. A machine for connecting an end of an optical fiber cable to an optical fiber connector, comprising:

stripping means for stripping an end of a jacket from the end of the optical fiber cable to expose an end of a fiber core;

connecting means for positioning the optical fiber cable and optical fiber connector so that the stripped end of the optical fiber cable can be positioned in a hole of a housing of the optical fiber connector, for inserting the stripped end of the optical fiber cable in the hole of the optical fiber connector housing with a length of the exposed end of the fiber core protruding slightly beyond a front end of the connector housing and for moving a retainer normal to the axis of the hole and into a securing position in the housing of the optical fiber connector thereby securing the end of the optical fiber cable in the optical fiber connector;

cutting means for cutting off the length of fiber core that protrudes beyond the front end of the optical fiber connector leaving a tiny length of protruding fiber core; and



surface-finishing means spaced from the cutting means for applying to the tiny length of protruding fiber core thereby finishing the end surface thereof.

4,944,080

METHOD AND APPARATUS FOR THE LONGITUDINAL DEBURRING OF SECTIONS

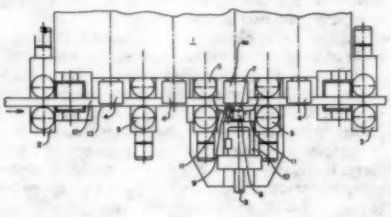
Götz-Peter Blumbach, Schwerte; Willi Brueckner, Hagen, and Rudolf Mueller, Ennepetal, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 54,958, May 28, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 175,752

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618224

Int. Cl.[5] B23P *13/02*; B23C *3/12*

U.S. Cl. 29—33 A **11 Claims**



1. A method for longitudinal deburring of sections utilizing an apparatus comprising a drive unit for driving said section through said apparatus, a milling unit having a rotatable tool head, drive means for driving said milling unit to enable said unit to move in a horizontal direction and in a vertical direction, sensing means for detecting the position of said burr, connecting means for connecting said sensing means and said drive means, wherein said sensing means outputs a signal to said drive means to cause said milling unit to move to a position in which said tool head may remove said burr and said sensing means comprises a roller sensor having a roller that engages said section on opposite sides of the burr characterized by the steps of driving said section through said apparatus, sensing the position of said burrs on said section with said roller sensor, outputting a signal from said roller sensor to said drive means to cause said milling unit to move to a position in which said tool head may remove said burr and rotating said tool head to remove said burr.

4,944,081

PACKING REMOVAL TOOL

Mark S. Ross, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,821
Int. Cl.[5] B23P *14/04*
U.S. Cl. 29—235 3 Claims

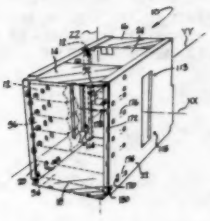
1. A packing removal tool comprising:
(a) a hollow shaft having first and second ends, said first end terminating in a substantially pointed tip having a screw-like surface;
(b) at least two barbed levers pivotally mounted to said first end of said shaft;
(c) means for urging said barbed levers outward from said shaft, said urging means comprising a substantially conical structure;
(d) means for actuating said urging means contained within said shaft, said actuating means comprising a spring loaded rod having first and second ends, said substantially conical structure affixed to said first end of said rod; and
(e) a handle affixed to said second end of said rod.

4,944,082

METHOD OF PROVIDING A SHEET METAL HOUSING WITH PRECISELY POSITIONED MOUNTING REFERENCES

David P. Jones, and Mark E. Wanger, both of Fort Collins, Colo., assignors to Hewlett Packard Co., Palo Alto, Calif.

Filed Apr. 27, 1989, Ser. No. 344,191
Int. Cl.[5] B23Q *3/00*
U.S. Cl. 29—467 11 Claims



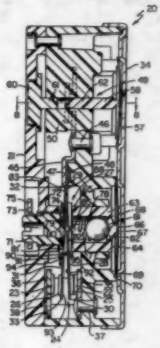
1. A method of providing a sheet metal housing with precisely positioned mounting references for accurately locating components of an internally mounted apparatus comprising the steps of:
(a) providing first and second sheet metal wall panels;
(b) forming a pair of housing assembly reference deformations at precise, predetermined positions on each of the wall panels;
(c) forming apparatus locating deformations on each of the first and second wall panels at precise predetermined locations relative to the pair of housing assembly reference deformations on each wall panel;
(d) mounting each of the wall panels on a predetermined portion of an assembly jig using the housing assembly reference deformations to precisely locate each wall panel on the jig;
(e) fixedly attaching other sheet metal wall panels between and to the first and second sheet metal wall panels thereby providing a rigid housing structure with the first and second sheet metal wall panels held in a predetermined fixed relationship;
(f) removing the assembly jig from engagement with the first and second sheet metal wall panels.

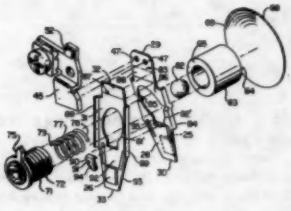
4,944,083

ELECTRICAL SWITCH CONSTRUCTION METHOD

Harold A. McIntosh, Crestline, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 145,053, Jan. 19, 1988, Pat. No. 4,875,278, which is a division of Ser. No. 885,865, Jul. 15, 1986, Pat. No. 4,736,514, which is a division of Ser. No. 694,350, Jan. 25, 1985, Pat. No. 4,633,211. This application Aug. 17, 1989, Ser. No. 395,320
The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.
Int. Cl.[5] H01H *11/00*
U.S. Cl. 29—622 2 Claims





1. In a method of making an electrical switch construction, said method comprising the steps of providing a support means, disposing a pair of spaced apart first and second fixed contacts to be carried by said support means, disposing a movable switch blade unit to be carried by said support means so that the contact means of the switch blade unit will be disposed in contact with said first fixed contact and out of contact with said second fixed contact when said switch blade unit is in a first position thereof and for being disposed in contact with

said second fixed contact and out of contact with said first fixed contact when said switch blade unit is in a second position thereof, and forming said switch blade unit to have a first flexible switch blade means having opposed ends one of which is secured to said support means and the other of which carries a first part of said contact means for making or breaking contact with said first contact means and a second flexible switch blade means having opposed ends one of which is secured to said first switch blade means to be carried thereby and the other of which is spaced from said other end of said first switch blade means and carries a second part of said contact means for making or breaking contact with said second fixed contact, the improvement comprising the steps of forming said switch blade unit to comprise a first substantially rigid member and a second substantially flexible member with each member having opposed ends, forming said second member to have an intermediate portion secured to one of said ends of said first member and one of said ends thereof secured to said support means, forming said first switch blade means to comprise said first member and the portion of said second member that extends between said intermediate portion thereof and said one end thereof, and forming said second switch blade means to comprise the portion of said second member that extends between said intermediate portion thereof and the other of said ends thereof.

4,944,084

FUSE AND MANUFACTURING METHOD THEREOF

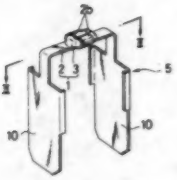
Kinya Horibe, and Hirohiko Fujimaki, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

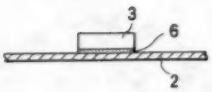
Filed Mar. 22, 1989, Ser. No. 327,088

Claims priority, application Japan, Mar. 23, 1988, 63-67354; Mar. 23, 1988, 63-67356

Int. Cl.[5] H01H *69/02, 85/04*

U.S. Cl. 29—623 **4 Claims**





1. A method of manufacturing a fuse having a predetermined electrical current rating, in which the fuse comprises a metallic fuse element made from a material having a relatively high melting point and a metallic chip made from a material having a relatively low melting point and having at least one contacting surface to the fuse element, the chip being adapted to melt and fuse with the fuse element to form an alloy therewith when an overcurrent which generates a heat melting only the material of the metallic chip flows through the fuse, and the formed alloy having a relatively high electrical resistance such that the alloy will be melted and the fuse will be rapidly ruptured by an overcurrent which exceeds the predetermined electrical current rating flowing through the fuse, and the fuse having means for preventing oxidation of the contacting surface of the metallic chip to the fuse element, the method comprising the steps of:

applying a metallic powder to the at least one contacting surface of the metallic chip;

placing the metallic chip onto the fuse element in such a manner that the contacting surface having the metallic powder contacts the fuse element; and

passing an electrical current to the fuse element for melting the metallic powder so as to partially fuse the chip to the fuse element, whereby said oxidation preventing means is formed.

4,944,085

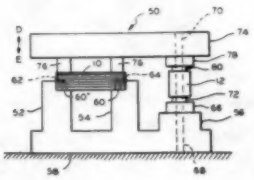
MEANS FOR ASSEMBLING ELECTRIC MOTORS WITH REDUCED END-PLAY

Max Lautner, Myrtle Beach, S.C.; Fred Hoffman, Chicago, and Edward Melnikov, Des Plaines, both of Ill., assignors to Uppco Incorporated, Chicago, Ill.

Division of Ser. No. 246,364, Sep. 20, 1988, Pat. No. 4,878,289. This application Apr. 25, 1989, Ser. No. 343,067

Int. Cl.[5] H02K *15/02*

U.S. Cl. 29—732 **5 Claims**



1. An apparatus for use in the manufacture of electric motors, said apparatus comprising first and second members mounted to move toward and away from each other, means on one of said members for supporting a stator and a rotor/shaft assembly in a side-by-side relationship, said rotor/shaft assembly having a compressible member thereon, means responsive to a dimension of said stator for limiting the motion of said members as they move toward each other, and means responsive to the movement of said members for compressing said compressible member to make the overall length of said rotor/shaft assembly including said compressible member match said dimension of said stator.

4,944,086

METHOD AND APPARATUS FOR ASSEMBLING ELECTRONIC AND/OR ELECTRIC PARTS TO BASE MEMBER

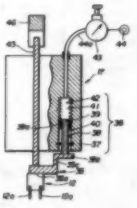
Tokihiro Nishihara, Chiba, and Yasushi Fukuda, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,956

Claims priority, application Japan, May 19, 1987, 62-122119

Int. Cl.[5] H05K *3/30;* **B23P** *19/00*

U.S. Cl. 79—837 **37 Claims**



1. A method for assembling an electronic and/or electric part on a substrate, which part has an connector pin to be

inserted through an opening formed through said substrate, comprising the steps of:

holding said part;

carrying said part to a predetermined orientation in relation to said substrate, at which said pin of said part is aligned to said opening;

shifting said part toward said substrate for inserting said pin into said opening;

monitoring magnitude of shifting of said part to detect at a predetermined position relative to said substrate, at which said opening is inserted into said opening in a first predetermined small magnitude;

detecting said part at said predetermined position, for stopping shift of said part toward said substrate;

releasing said part from holding;

exerting a second controlled magnitude of depression force greater than the first force to further insert said pin through said opening in response to releasing of holding;

monitoring position of said part to detect the position of the part where said pin is fully inserted through said opening; and

monitoring means detecting said fully inserted position of said pin, for clamping end of said pin for fixing said part on said substrate.

6. An apparatus for assembling an electronic and/or electric part on a substrate, which part has a connector pin to be inserted through an opening formed through said substrate, comprising:

means for holding said part and carrying the latter to a predetermined orientation in relation to a substrate, at which said pin of said part is aligned to said opening;

means for shifting said part holding means toward said substrate for inserting said pin into said opening;

means, cooperative with said shifting means, for monitoring a magnitude of shifting of said part holding means to detect said part holding means at a predetermined position relative to said substrate, at which said pin is inserted into said opening in a first predetermined small magnitude;

means, responsive to said monitoring means detecting said part holding means at said predetermined position, for deactivating said shifting means and releasing said part holding means;

means, responsive to said deactivating means releasing holding, for exerting a second controlled magnitude of depression force greater than said first predetermined small magnitude to further insert said pin through said opening

means for monitoring position of said part to detect the position of the part where said pin is fully inserted through said opening; and

means, responsive to said part position monitoring means detecting said fully inserted position of said pin, for clamping end of said pin for fixing said part on said substrate.

4,944,087

METHOD OF MAKING A CURVED PLASTIC BODY WITH CIRCUIT PATTERN

Vincent R. Landi, Danielson, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Oct. 5, 1988, Ser. No. 253,974
Int. Cl.[5] H05K *3/12*
U.S. Cl. 29—848 **17 Claims**

1. A method of making an article having a circuit pattern embedded on a surface of the article comprising:

forming a metallic circuit pattern on a flexible substrate to define a flexible circuit, wherein the circuit pattern is bonded to the substrate by an adhesive layer between the circuit pattern and the substrate;

placing said flexible circuit into a mold cavity with the circuit pattern facing toward the interior of the mod cavity;

introducing a molding compound into said mold cavity to fill the mold cavity, wherein said molding compound is forced against said flexible circuit;

curing said molding compound to define an article;

removing said article from the mold cavity with said flexible circuit embedded on the surface of the article; and

LAMINATE FLEXIBLE SUBSTRATE TO COPPER USING ADHESIVE
STEP 1
LITHOGRAPHIC PRINTING OF CIRCUIT TO FLEXIBLE SUBSTRATE
STEP 2
PLACEMENT OF FLEXIBLE CIRCUIT INTO MOLD
STEP 3
MOLDING STAGE: FORCING MOLDING COMPOUND INTO MOLD
STEP 4
REMOVAL OF MOLDED OBJECT FROM MOLD
STEP 5
RINSE TO REMOVE FLEXIBLE SUBSTRATE
STEP 6
MOLD OUTER LAYER OF MOLDING COMPOUND OVER MOLDED OBJECT
STEP 7
MOLD ADDITIONAL CIRCUITS TO FORM MULTILAYER CURVED CIRCUITRY
STEP 8

removing the adhesive layer to release said flexible substrate from said article while leaving said circuit pattern embedded on the surface of the article

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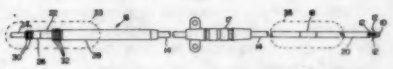
4,944,088

RING ELECTRODE FOR MULTICONDUCTOR PACING LEADS

Phong D. Doan, Shoreview; Kenneth E. Cobian, St. Anthony; James E. Upton, New Brighton, and Daniel C. Haeg, Brooklyn Park, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 25, 1988, Ser. No. 198,539
Int. Cl.[5] H01R *43/00*
U.S. Cl. 29—858 **4 Claims**



1. A method for fabricating an electrode for a medical electrical lead, comprising the steps of:

selecting a multifilar coil having at least two conductors and terminating one of the conductors intermediate the ends of the coil;

selecting a cylindrical sleeve of a thermoplastic material, having an internal lumen and a bore perpendicular to the internal lumen and sliding said sleeve over said multifilar coil and bringing the end of said terminated conductor out through said bore;

placing said sleeve and coil into a mold and applying heat, causing said sleeve to bond to said multifilar coil and to flow between the conductors of said multifilar coil;

sliding a cylindrical ring electrode over said sleeve intermediate the proximal and distal ends of said sleeve and electrically coupling said end of said terminated conductor to said cylindrical electrode; and

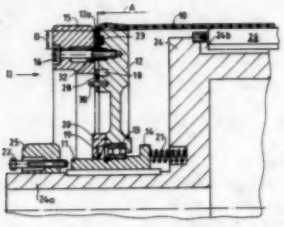
sliding first and second insulative sheaths over the proximal and distal ends of said sleeve, respectively, placing said ring electrode and the ends of said first and second sheaths into a mold and applying heat to bond the portions of said sleeve located proximal and distal to said electrode to said first and second sheaths to provide a continuous electrically insulative and fluid tight tubular structure extending through said ring electrode and to collapse the bore of said sleeve around said terminated conductor to provide a fluid seal.

4,944,089

MOUNTING A PRESS SHELL TO A PRESS ROLL FOR DEWATERING A WEB

Hans Flämig, Heidenheim; Andreas Schütte, Steinheim; Christian Schiel, Heidenheim; Karl Steiner, Herbrechtingen, and Josef Müllner, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Division of Ser. No. 267,023, Nov. 4, 1988, Pat. No. 4,878,281.
This application Oct. 30, 1989, Ser. No. 428,639
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1988, 3805350
Int. Cl.[5] B21D *31/00*
U.S. Cl. 29—895.22 3 Claims



1. A method for attaching a press shell to a press roll, wherein the press roll comprises:

a support body having a support area on its periphery and also having longitudinal axis and a longitudinally axially outward end;

a press shell support element located outward of the support body in the longitudinally axial direction of the support body;

the support element having an outer side face facing away from the support body;

a flexible, liquid impervious press shell disposed around the support body for being supported by the support area and also being disposed around the support element, the press shell having an edge zone; a plurality longitudinally axially outwardly projecting tongues defined on the edge zone and arrayed around the edge zone;

the press shell being of sufficient width to extend longitudinally axially beyond the axially outward end of the support body and to extend longitudinally axially outwardly beyond the outer side face of the shell support element and to be turned radially inwardly around the side face of the shell support element;

the method comprising:

disposing the press shell around the support body and moving the press shell so that the edge zone thereof extends longitudinally axially outward of the side face of the shell support element;

drawing the edge zone of the press shell radially inwardly over the side face of the shell support element by engaging each of the tongues of the press shell and moving each tongue radially inwardly and securing each tongue on a respective press shell holding element which projects out of the side face of the shell support element; and

thereafter clamping the edge zone of the press shell to the side face of the shell support element radially outward of the holding element.

4,944,090

RAZOR HEAD WITH YIELDABLE SHAVING AID

Stanley Sumnall, 2551 N. 17th, Springfield, Oreg. 97477

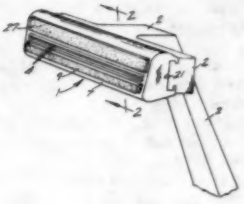
Filed Apr. 3, 1989, Ser. No. 331,832
Int. Cl.[5] B26B *19/44, 21/00, 21/40*
U.S. Cl. 30—41 9 Claims

1. An elongate razor head including,

a blade,

a soluble body movable relative said head,

said head defining a chamber to receive said soluble body and an opening through which said body may protrude for skin contact, and



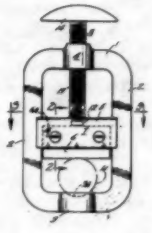
spring means attaching said body to said head, said spring means having a distal portion, said soluble body attached to said distal portion by adhesive means said spring means urging said body outwardly of said opening for biased contact with the user's skin.

4,944,091

NUT SPLITTING DEVICE

Paul E. Johnson, 1115 Main St., Springfield, Oreg. 97477

Filed Jul. 17, 1989, Ser. No. 380,803
Int. Cl.[5] B26B *17/00*
U.S. Cl. 30—120.2 3 Claims



1. A device for splitting nutshells comprising,

a base including a nutshell support and parallel guides,

a carrier on said guides and including a wedge, said carrier including flanges upwardly spaced from said wedge, and

adjustable means in threaded engagement with said base and with said carrier for imparting rectilinear travel thereto to urge the splitting member into and out of contact with a nut on said support, said adjustable means including a foot confined between said flanges and the wedge.

4,944,092

DEVICE FOR CUTTING THE STALK OF A FLOWER OR PLANT

Franciscus J. De Groot, Laren; Jan W. De Swart, CL Maarsen, and Jan Boerhoop, HP Woerden, all of Netherlands, assignors to Handelsvennootschap onder de firma Stengelbengel B.V., Maarssen, Netherlands

Filed Feb. 21, 1989, Ser. No. 312,168
Claims priority, application Netherlands, Feb. 22, 1988, 8800349
Int. Cl.[5] B25F *3/00*; B26B *1/06, 3/00*
U.S. Cl. 30—134 8 Claims

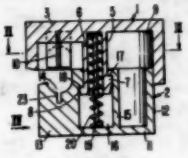
1. Device for cutting the stalk of a flower or plant, said device comprising:

at least two elements which are movable with respect to

each other and pressed away from each other by a resilient means until a portion of one of the elements engages an abutment connected to the other element;

wherein the portions of both elements which are slid into each other being provided with cavities which, when the elements are pressed fully away from each other, form a bore running transverse to the direction of movement, said bore being adapted to receive a stalk;

the cavity in said first element having the shape of a hollow support surface for the stalk;



a knife being provided in the cavity of said second element, so that the stalk laid on the hollow support surface of the first element will be cut when the elements are pressed towards each other;

said cavities being shaped such that a stalk-receiving opening is defined in the pressed-apart position of both elements through which opening a stalk can be brought onto the hollow support surface of said first element.

4,944,093

FORCEPS WITH SHEARING JAWS

Ernst Falk, Sternenfels-Diefenbach, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Oct. 24, 1988, Ser. No. 261,487

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736150

Int. Cl.[5] B23P *19/02*

U.S. Cl. 30—251 **1 Claim**

1. A forceps, in particular shears, comprising a tubular shaft having a recess transversing a distal end of the shaft from top to bottom to form a stationary shearing jaw, a scissors grip being mounted at a proximal end of the shaft, a push and pull rod extending in said shaft having a proximal end connected to a movable handle of the scissors grip, a movable shearing jaw being mounted on the stationary jaw by a transverse spindle for pivotable movement, said movable jaw being pivotably connected to a distal end of the push and pull rod to move between a closed position received in said recess and an opened position as said movable handle is moved, first stop means for defining the closed position comprising a step on the push and pull rod engaging an edge provided on said shaft adjacent the distal end thereof, and second stop means for defining the opened position comprising a stop edge on said movable jaw coating with a stop surface on said push and pull rod, said recess having a bottom portion extending proximally from the spindle to form a bottom shaft slot having a proximal edge forming said edge on said shaft of the first stop means, said push and pull rod having a flattened distal extension received in said slot, said step being provided on said extension and said stop surface being formed by an upper edge of said extension, said movable jaw at a proximal end having a bifurcating recess receiving a distal end of the flattened distal extension of the push and pull rod, said bifurcating recess having a base surface forming said stop edge of the movable jaw.

4,944,094

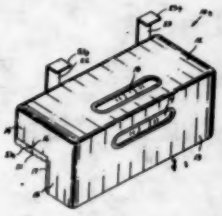
PICTURE FRAME LEVELING TOOL

Joseph G. Depiano, and Linda S. Schmidt, both of 4320 Deyo, Brookfield, Ill. 60513

Filed Sep. 11, 1989, Ser. No. 406,030

Int. Cl.[5] G01C *9/28*

U.S. Cl. 33—371 **5 Claims**



1. A picture frame leveling tool for positioning a picture frame in an aligned orientation relative to a vertical support surface, wherein the tool comprises,

a first elongate leg integrally and orthogonally mounted to a second elongate leg at a 90 degree apex to define an elongate "L" shaped body, wherein the first leg includes an exterior horizontal surface and the second leg includes an exterior vertical surface, wherein each exterior surface includes a visual indicator longitudinally aligned with each respective leg, the first leg includes an interior horizontal surface with a rear wall surface orthogonally joined to the respective exterior horizontal surface and the interior horizontal surface, and the second leg includes an interior vertical surface orthogonally intersecting the interior horizontal surface, and

the first and second legs of an equal thickness, and

wherein the interior horizontal surface is defined by a predetermined width and further including a selectively mountable resilient cushion layer of a polymeric material of a width equal to the predetermined width selectively mounted to the interior horizontal surface to provide an enhanced friction engaging surface for the picture frame, and

further including a first and second latch plate member reciprocatably mounted to the rear wall surface, each latch plate member defined by a respective first and second plate member slidably mounted relative to the rear wall surface, and

wherein the first and second latch plate includes a respective first and second grasp handle orthogonally secured to the respective first and second latch plate and directed overlying the exterior horizontal surface of the first leg, and

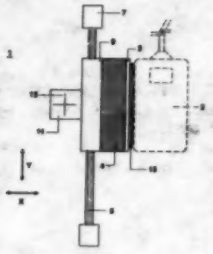
wherein the first and second latch plates further include a respective first and second guide loop, wherein each guide loop is mounted to the rear wall surface and aligned longitudinally with the rear wall surface to slidingly receive the respective first and second latch plates orthogonally relative to the rear wall surface.

4,944,095

GUIDING DEVICE FOR A COMPUTER MOUSE

James Anglehart, 1537 Summerhill, Apt. 208, Montreal, Quebec, Canada H3H 1C2

Filed Dec. 20, 1989, Ser. No. 453,862
Int. Cl.[5] B43L 7/00; H04N 1/10
U.S. Cl. 33—403 14 Claims



1. A guiding device for use with a computer mouse, the device comprising:

a body;

securing means provided on said body for securing said mouse to said body while allowing said mouse to operate on a working surface;

bearing means fixed to said body;

roller means including a horizontal shaft having a longitudinal axis and two ends, said shaft being rotatable in said bearing means, said bearing means being axially translatable on said shaft, said roller means further including working surface engaging wheels fixed to each end of said two ends, said roller means substantially supporting said body; and

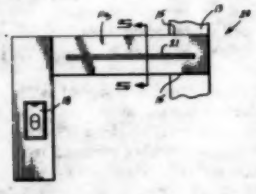
sighting means connected to said body for guiding said device to trace an image on said working surface, said device being able to be moved on said working surface in a direction of said axis by a translation of said bearing means on said shaft and in a direction perpendicular to said axis by a rolling of said wheels on said working surface.

4,944,096

WALL STUD CENTERING SQUARE

Sherman D. Tolley, Rt. 4, Box 3455, Elizabethton, Tenn. 37643

Filed Sep. 11, 1989, Ser. No. 406,024
Int. Cl.[5] B43L 7/06
U.S. Cl. 33—480 2 Claims



1. A wall stud centering square comprising,

a first rule blade member including a pair of opposed parallel longitudinal edges terminating in orthogonal first end edge, and

an elongate second rule blade member connected to said first rule blade member at one end thereof orthogonally thereto, said second rule blade member including a plurality of opposed longitudinal edges, each disposed orthogonally relative to said longitudinal edges of said first rule blade member, and

a bubble type liquid level indicator formed medially of said second rule blade member, and

said first rule blade member including a positioning member formed longitudinally of and medially through the first rule blade member wherein the positioning member is coextensively formed within the first rule blade member medially of the longitudinal side edges of the first rule blade member and terminating to a position adjacent a remote free end of the first rule blade member, and

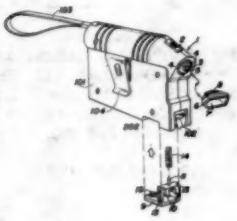
wherein the positioning member includes a knife edge portion including a plurality of aligned knife edges portions extending above and below the first rule blade member, wherein the knife edges are positioned medially of the longitudinal side edges of the first rule blade member for anchoring the first rule blade member onto an underlying construction stud.

4,944,097

MEASURING TAPE WITH LIGHT

Dongmin Kang, Pusan, Rep. of Korea, assignor to Korea Measures Co., Ltd., Pusan, Rep. of Korea

Filed Aug. 9, 1989, Ser. No. 391,479
Claims priority, application Rep. of Korea, Mar. 20, 1989, 3426[U]
Int. Cl.[5] G01B 3/10
U.S. Cl. 33—760 8 Claims



1. A measuring tape assembly comprising:

a housing having a front wall with a lower hole therethrough, said housing defining an upper space opening through an upper portion of said front wall;

a flashlight in said upper space for directing light outwardly from said front wall;

a measuring tape rolled in said housing and extending through said lower hole for projecting out of said housing;

a clamp mounted for movement in said housing adjacent said lower hole, said clamp including at least one jaw for engagement with said measuring tape to hold said measuring tape in a projected position from said housing;

a spring engaged between said housing and said clamp for biasing said clamp downwardly to engage said jaw against said measuring tape, at least a portion of said clamp being accessible from outside said housing for raising said clamp against said spring to release said tape;

said housing having a bottom wall with an opening therethrough positioned near said front wall, said clamp comprising an L-shaped member having a lower leg positioned in said bottom wall opening and an upstanding leg having a passage through which said measuring tape extends, said upstanding leg carrying said at least one jaw, said housing including at least one supporting jaw positioned below said measuring tape near said lower hole and aligned with said jaw on said clamp for engagement of said measuring tape;

a pin extending upwardly from said upstanding leg, said housing including a spring support positioned above said upstanding leg, said spring comprising a coil spring en-

gaged around said pin and compressed between said spring support and said upstanding leg; and

said flashlight comprising a bulb mounted in said upper space, a switch slidably mounted to a top of said housing near said front wall and a cap having an opening therethrough for engagement onto said bulb, said cap including a pair of retaining grooves and said upper space including a pair of projecting tongues for engagement with said pair of grooves for retaining said cap over said upper space.

4,944,098

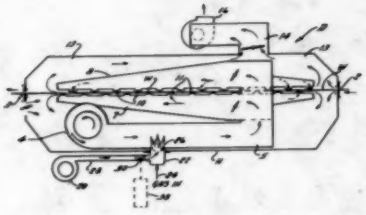
HIGH VELOCITY RUNNING WEB DRYER HAVING HOT AIR SUPPLY MEANS

Terry A. Hella, DePere, and Gary L. Perry, White Lake, both of Wis., assignors to Advance Systems, Inc., Green Bay, Wis.

Filed Apr. 24, 1989, Ser. No. 341,816

Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—156 **6 Claims**



1. A high velocity web dryer having a series of upper and lower air bars for floatingly suspending a running web as the web moves through the dryer, means for furnishing hot air to said bars for drying the web, said means including a gas fired burner and a source of combustion air for said burner, and control means for controlling the admission of combustion air to said gas fired burner, said control means including adjustable valve means for controllably admitting combustion air to said burner, said valve means including initial air admitting means for providing initial air through said valve means prior to partial opening of said valve means, to thereby provide a relatively smooth and excessive surge-free supply of air to said burner, whereby a stable air supply system is provided without oxygen starvation and without blowing out a flame of the burner.

4,944,099

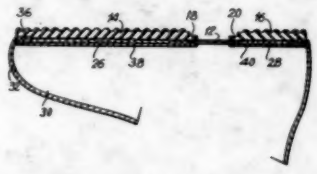
EXPANDABLE OUTSOLE

Howard Davis, New York, N.Y., assignor to Slingshot Corporation, Palmer, Mass.

Filed Aug. 30, 1988, Ser. No. 238,614

Int. Cl.[5] A43B *3/26*

U.S. Cl. 36—97 **22 Claims**



1. A shoe outsole suitable for outdoor wear comprising:

a front outsole portion comprised of a semi-rigid material suitable for outdoor use, said front outsole portion having a ledge extending widthwise across the back end thereof;

a rear outsole portion comprised of a semi-rigid material suitable for outdoor use, said rear outsole portion having a ledge extending widthwise across the front end thereof wherein said ledges of the front and rear outsole portions extend upwardly away from the bottom of the front and rear outsole portions so that the ledges do not contact the ground; and

an elastic shank extending between said front and rear outsole portions, and means extending through said shank and said ledges for joining said shank to said outsole portions.

4,944,100

CLOSURE AND ADJUSTMENT DEVICE, PARTICULARLY FOR SKI BOOTS

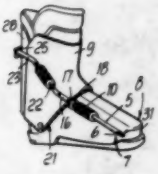
Mariano Sartor, Montebelluna, and Valerio Tonel, Barbisano, both of Italy, assignors to Nordica S.P.A., Montebelluna, Italy

Division of Ser. No. 78,986, Jul. 29, 1987. This application Nov. 16, 1989, Ser. No. 436,849

Claims priority, application Italy, Aug. 1, 1986, 82566 A/86; Oct. 29, 1986, 59462/86[U]; Oct. 29, 1986, 59464/86[U]

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—120 **7 Claims**



1. In a ski boot of the rear entry type having a shell, a front quarter including an instep portion and a rear quarter with a rear surface and with attachment means for pivotally connecting said front and rear quarters to said shell,

an adjustable closure device for releasably closing said rear quarter against said front quarter to secure a skier's boot therebetween, comprising

a U-shaped bracket member including a pair of leg-like elements having free ends and rear ends and extending along each side of said front and rear quarters, said U-shaped bracket member having

a transverse body portion connecting said leg-like elements approximately at the rear ends thereof and arranged to face the rear surface of said rear quarter,

pivot means defining a pivot axis for pivotally fastening the front ends of said leg-like elements on said front quarter, thereby to allow said transverse body portion to move past said rear surface of said rear quarter in a plane perpendicular to said pivot axis when said leg-like elements are rotated about said pivot axis, said rear quarter having

a toothed formation protruding rearwardly from said rear surface thereof, said transverse body portion having

lever means pivotally attached thereon and movable from an opening position into a closed position thereof and vice versa, said lever means having

at least one pawl formation engageable with said toothed formation in closed position of said lever means.

4,944,101

APPARATUS AND METHOD FOR RECOVERING MATERIALS FROM FLUID BODIES

Robert H. Goble, P.O. Box 690013, Orlando, Fla. 32869

Filed Aug. 11, 1989, Ser. No. 392,587

Int. Cl.[5] F16K *55/18, 15/00*; F16L *55/18*; B01D *21/30*

U.S. Cl. 137—15 **13 Claims**

1. A method for removing leaves, trash and other materials

from a spa, pool, aquarium or other similar fluid body, the method comprising the steps of:

(a) providing a generally tubular member having first and second open ends, a portion of enlarged cross-section adjacent said second end, an exhaust opening extending through said enlarged portion and valve means for permitting fluid flow from said second open end into said enlarged portion and only out of said exhaust opening;

(b) trapping air in said tubular member by covering said first open end;

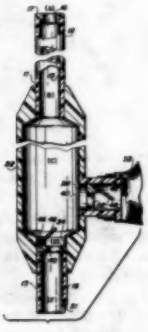
(c) extending said second open end into a fluid body and adjacent recovered materials to be removed;

(d) uncovering said first end to release the trapped air and to effectuate the flow of fluid and material into said second end and into said enlarged portion;

(e) lifting said tubular member at least partially out of said fluid body so that said fluid and recovered materials flow out of said enlarged portion only through said exhaust opening;

(f) trapping said recovered materials at said exhaust opening and simultaneously passing said fluid; and

(g) repeating steps (b) through (f) above until all of the materials are removed.



2. Apparatus for recovering sand, leaves, trash and other materials from a spa, pool, aquarium or other similar fluid body, said apparatus comprising:

a hollow generally tubular member having first and second ends and a dimension between said ends such that said first end extends above a fluid body from which materials are to be removed and such that said second end extends into said fluid body adjacent to the area where the material is located;

said tubular member having a first aperture at said first end which may be opened or closed to alternately release or trap air within said tubular member;

said tubular member having a second aperture at said second end;

an exhaust opening along said tubular member near said second end for venting fluid within said tubular member

means over said exhaust opening for trapping said recovered materials flowing from said exhaust opening; and

a one-way valve is said tubular member between said second aperture and said exhaust opening for permitting the passage through said valve in a first direction of fluid and material toward said exhaust opening from said second aperture and restricting flow in a direction opposite to said first direction.

4,944,102

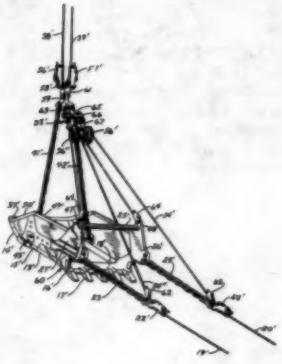
HIGH PRODUCTION SYSTEM BUCKET

Donald J. Behlendorf, Franklin; Frederick J. Kelp, Franksville, both of Wis., and Robert L. Benson, Underwood, N. Dak., assignors to Bucyrus Erie Company, South Milwaukee, Wis.

Filed Jun. 22, 1989, Ser. No. 370,416

Int. Cl.[5] E02F *3/47*

U.S. Cl. 37—135 **10 Claims**



1. A high production excavating bucket sytem comprising:

a bucket having side walls, a rear wall and a floor having a forward lip with excavating teeth extending therefrom; and

drag and dump lines connected to a forward portion of said bucket and hoist lines connected to rearward portions of said side walls;

said side walls having upper wall edges, a major forward portion of which is substantially parallel to the floor and a rear portion of which slopes downwardly to a top edge of the rear wall to provide a partially open area of the rear of said bucket, said open area defined by the rear portions of the upper wall edges of the side walls and the top edge of the rear wall to afford a complete dumping of said bucket before engagement with said hoist lines.

4,944,103

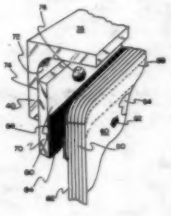
SPREADER ATTACHMENT APPARATUS

Michael J. Rzechula, Elizabethtown, Ill., assignor to Slick Ice Limited, Elizabethtown, Ill.

Filed Sep. 27, 1989, Ser. No. 411,115

Int. Cl.[5] E01H *4/00*

U.S. Cl. 37—219 **15 Claims**



1. A spreader attachment for an ice resurfacing machine of the type having a front and rear, a laterally extending housing with a rigid frame portion to be positioned in close proximity to a subjacent surface to be treated and having associated means for delivering water from a supply against a subjacent

surface, and means for moving the housing across a subjacent surface to be treated, said spreader attachment comprising:

an elongate support bar;

means for securing the support bar to the rigid frame portion so that the length of the support bar is substantially horizontally situated along the lateral extent of the housing, said support bar having a laterally extending support surface;

a spreader element with an attachment surface for engagement with a subjacent surface to distribute water from said supply evenly on a subjacent surface across the lateral extent of the housing as the housing is moved; and

cooperating means on the spreader element and support bar for releasably attaching the spreader element to the support bar in operative position thereon by movement of the attachment surface on the spreader element towards and against the support surface on the support bar and for releasing the spreader element and separating the spreader element from the support bar by movement of the attachment surface on the spreader element away from the support surface on the support bar.

4,944,104

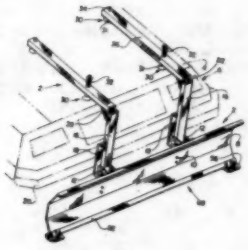
DETACHABLE SNOW PLOW ASSEMBLY

Dennis Kowalczyk, 7712 Princeton Pl., Middleburg Heights, Ohio 44130

Filed Jul. 13, 1988, Ser. No. 219,057

Int. Cl.[5] E01H *5/04*

U.S. Cl. 37—231 **21 Claims**



1. In combination with a snow plow blade and a vehicle having a hood and a bumper, the improvement comprising a pair of blade attachment assemblies generally symmetrically extending from the blade, each of the assemblies including an upright arm engageable by the vehicle bumper, each upright arm having a generally horizontal extension and means for detachably securing said horizontal extension to the hood.

4,944,105

ADJUSTABLE BASE FOR NEEDLEWORK FRAME

Gaylon E. Schulle, 52 Sundown Pkwy., Austin, Tex. 78746

Filed May 19, 1989, Ser. No. 354,132

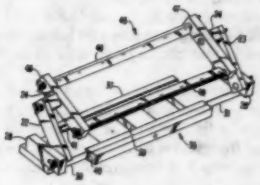
Int. Cl.[5] D06C *3/08*

U.S. Cl. 38—102 **4 Claims**

1. An adjustment base for supporting any frame selected from a group of needlework frames of generally rectangular configuration, the frames having means thereon for holding a piece of fabric, the frames of the group having several different lengths within a predetermined range of lengths, the base comprising

means defining a generally H-shaped structure with generally U-shaped recesses at both ends thereof separated by a central portion, each said recess having parallel edges facing each other;

first and second end members, each said end member including a slider plate having parallel opposite edges, a support arm attachable to one end of one of said frames and means for holding said support arm on said slider plate, each said slider plate being dimensioned to fit between said parallel edges; and



guide means on said parallel edges for receiving said slider plates, said slider plates being independently movable toward and away from said central portion to vary the spacing between said support arms, thereby to select a proper spacing to receive a selected one of said frames.

4,944,106

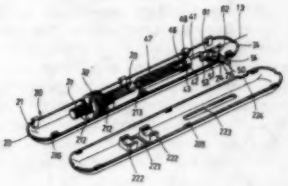
FISHING HOOKER OR CATCHER

Jaw-Shyong Wu, No. 15-3, Ming-Li St., Tai-Chung City; Yun-Terng Wang, No. 50-3, Chung-Shin Rd., Pu-Li Chen, Nan-Tu-Hsien; Hann-Chang Wu, No. 85, Pei-Chern St., Pu-Li Chen, Nan-Tu Hsien, and Jiin-Tsong Shieh, No. 5, Sec. 1, Shi-An Rd., Pu-Li Chen, Nan-Tu Hsien, all of Taiwan

Filed Sep. 22, 1989, Ser. No. 410,813

Int. Cl.[5] A01K *97/00*

U.S. Cl. 43—15 **6 Claims**



1. A fishing apparatus comprising a fishline-holding device which includes:

an elongated hollow housing having a first and and second end, said housing being formed of two halves which are detachably engaged with each other, said two halves having two opposed guide slots respectively and longitudinally formed therein, and two separate clamp members mounted near said first end of said housing;

a sliding member having a push rod connected thereto which is slidably mounted in said two guide slots of said housing so that said sliding member can be longitudinally moved along said guide slots, and a hook member extending longitudinally therefrom towards said second end of said housing;

a threaded rod longitudinally disposed in said housing and clamped by said clamp members of said housing so that said threaded rod can be moved longitudinally and prevented from rotation thereat, said threaded rod having an adjusting member mounted thereon by means of the interconnection of an internal thread provided in said adjusting member and an external thread provided on the threaded rod, said adjusting member being rotatably retained between said clamp members of said housing and having a portion thereof protruding out of an opening formed in

said housing, so that said adjusting member can be axially rotated by a user's fingers to enable said threaded rod to move longitudinally;

a biasing member interconnected between said sliding member and said threaded rod so as to urge said sliding member toward said threaded rod;

means for retaining said hook member of said sliding member against a biasing action of said biasing member, which is mounted in said housing near said second end thereof; and

a linking member which links said hook member of said sliding member and said retaining means, being attached to an end of a fishline so that said hook member can be disengaged from said retaining means by the pulling of the said fishline which is triggered by a fish snapping at an baited hook attached to said fishline.

4,944,107

FIXED AND SLIDING FISHING SINKERS

Roger S. Wymore, 4612 F Ave. NE., Cedar Rapids, Iowa 52402

Filed Dec. 5, 1988, Ser. No. 280,308
Int. Cl.[5] A01K *95/00*
U.S. Cl. 43—44.89 **4 Claims**

1. A fishing sinker comprising a spherical body with two spherical segments removed from opposite sides and centered on an equatorial plane of said sphere, a mouth segment extending past the center line and having formed into two surfaces of groove a curve approximating a sin wave of $y=\sin x$, said curves center, where x is equal to zero, being on a perpendicular bisector of a throat line of the mouth segment, the curve gradually lessening in amplitude until nearly a straight line at said throat line, the other removed segment being truncated but whose surfaces projected approximately intersect the mouth segment throat line said truncated portion remaining forming an integral hinge and connecting the two remaining segments of said body, two steps, one above and one below the second removed section forming nearly parallel surfaces whereby coupled pressure applied to these surfaces can revolve open the mouth groove about said hinge for removal of fishing line, the fixing of the sinker on said fishing line occurring by coupled pressure on the opposite side of the hinge and to the spherical surfaces.

4,944,108

SYSTEM FOR HARVESTING CRUSTACEANS

Albert L. George, Lafayette, and Don Gooch, Erath, both of La., assignors to Crawfish Technology of South Carolina, Inc., Columbia, S.C.

Continuation-in-part of Ser. No. 5,590, Jan. 21, 1987, Pat. No. 4,798,020. This application Jul. 21, 1988, Ser. No. 222,718
Int. Cl.[5] A01K *81/04*
U.S. Cl. 43—6.5 **15 Claims**

1. A system for harvesting crustaceans out of a flooded area, the system comprising:

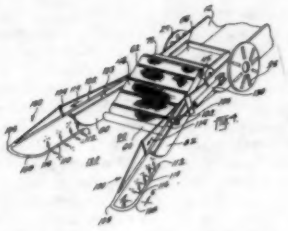
(a) a vessel movable through the water, the vessel having a forward portion;

(b) a primary roller attached to the forward portion;

(c) a first primary conveyor secured to the forward portion of the vessel behind the primary roler, so that crustaceans are moved rearwardly from the primary roller and deposited onto the conveyor as the vessel moves forward;

(d) means on the conveyor for maintaining the crustaceans on the surface of the conveyor as the conveyor moves rearwardly;

(e) means forward of said primary roller for educting water and air for disturbing the crustaceans in advance of the vessel, yet maintaining the crustaceans in the area substantially defined by the space between said educting means;



(f) receiving means in the vessel for receiving the crustaceans as the crustaceans are removed from the conveyor; and

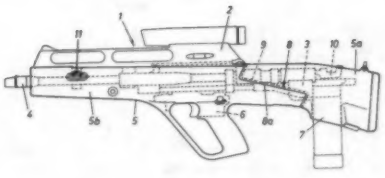
(g) means for separating grass collected by the conveyor from the crustaceans and returning the grass to the flooded area, the separating and returning means positioned between the primary conveyor and the receiving means.

4,944,109

RIFLE

Ulrich Zedrosser, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Sep. 7, 1989, Ser. No. 404,079
Claims priority, application Austria, Sep. 23, 1988, 2353/88
Int. Cl.[5] F41C *23/00*
U.S. Cl. 42—71.01 **5 Claims**



1. A rifle comprising

a receiver having a front portion and a rear portion,

a firing mechanism mounted in said receiver,

a barrel detachably connected to said receiver, said barrel having a front end and a rear end and defining a longitudinal direction,

a two-part stock, which covers said receiver and said barrel at least in part, said stock comprising a front part and a butt part extending along said longitudinal direction with said front part being in front of said butt part, said front part covering said barrel at least in part,

locking means detachably connecting said stock to said receiver,

a trigger mechanism mounted in said front part of said stock, and

a magazine holder mounted in said butt part of said stock,

said front part of said stock being slidably fitted on said front portion of said receiver and being forwardly removable from said front portion,

said butt part of said stock being slidably fitted on said rear portion of said receiver and being rearwardly removable from said rear portion,

each of said front and butt parts being detachably connected to said receiver by part of said locking means,

an interface along which said front and butt parts contact each other, said interface comprising an intermediate portion extending on opposite sides of said stock approximately in said longitudinal direction, and

one of said front and butt parts being formed on opposite sides of said stock along said interface with edge flanges, which overlap the other of said front and butt parts.

4,944,110

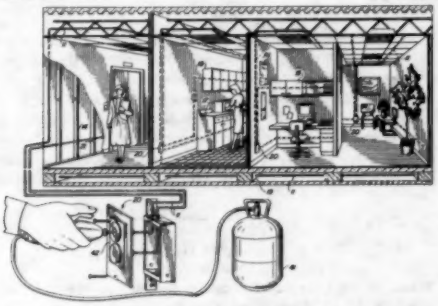
INTEGRATED PEST CONTROL SYSTEM

Gregory A. Sims, Winter Springs, Fla., assignor to Extermination Systems, Inc., Orlando, Fla.

Filed Sep. 8, 1988, Ser. No. 242,041

Int. Cl.[5] A01M *7/00*

U.S. Cl. 43—124 **21 Claims**



1. A method of applying pest control substances to the interior of a building, comprising the steps of:

injecting a quantity of an expanding pest control substance under pressure into a receptacle mounted first open end of a length of a flexible tubing having a second closed end, the tubing running through a plurality of concealed cavities of a building; and

releasing the injected substance into the cavities through a plurality of apertures valveless in the tubing located in respective ones of the cavities;

whereby the released substance expands to provide pest control protection within the cavities.

4,944,111

HOOK AND LINE MINDER

Gordon S. Daniel, 3243 Rio Grande Trail, Kissimmee, Fla. 32741

Filed Mar. 29, 1989, Ser. No. 330,073

Int. Cl.[5] A01K *97/06*

U.S. Cl. 43—25.2 **2 Claims**

1. A hook and line minder device which comprises, a body removably attachable to a fishing pole for holding a fishing line, a fish hook leader, and an attached fish hook, a hinge means is secured to said body, for opening and closing said body, and a fastening means secured to said body for holding said body to said fishing pole, wherein said body is cylindrical and includes a longitudinal opening defined by a longitudinal groove provided in a pair of inner sleeve halves, and the longitudinal opening removably receives said fishing pole, wherein said pair of inner sleeve halves are fabricated of a resilient foam material wherein a barb of said fish hook may be embeded therein and retained for safety wherein a pair of outer sleeve halves are received in recessed areas provided in outer peripheral surfaces of said pair of inner sleeve halves and impart rigidity to said body and said hinge means is fabricated of a

flexible material and is fixedly secured to portions of said pair of outer sleeve halves.

4,944,112

LURE SYSTEM WITH ADAPTABLE INSITU BILL ASSEMBLY

Douglas L. Garmany, 816 Evergreen Dr., Houston, Tex. 77023, and James B. Hughes, P.O. Box 231372, Houston, Tex. 77223

Filed May 25, 1989, Ser. No. 357,177

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.09 **12 Claims**

1. In a lure system, including a head portion and a body portion, adaptable to a plurality of depths and movement characteristics, an insitu adjustable bill assembly detachably interconnected with said head portion, comprising

a bill base portion fixedly attached to the face of said head portion,

a bill extender portion having channel means adapted to be slidably and releasably received by said bill base portion,

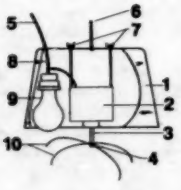
said channel means comprising a recess region disposed upon the top surface of said bill extender portion configured to receive corresponding keyway means disposed longitudinally and symmetrically upon the bottom surface of said bill base portion, and

said recess region having slot means disposed longitudinally through and symmetrically of said recess region, to receive said keyway means, and further having a plurality of nipple-like projections disposed upon the top surface thereof, to securably receive a corresponding plurality of cavities disposed upon the bottom surface of said bill base portion.

4,944,113
FISHING FLOAT
Lisa Jean, No. 29, Yu Jen St., Wu Feng Hsiang, Taichung Hsien, Taiwan
Filed Dec. 11, 1989, Ser. No. 448,353
Int. Cl.[5] A01K 93/00
U.S. Cl. 43—43.14 2 Claims

1. A fishing float comprising a spindle at an upper portion, a bob at a middle portion and a tail at a lower portion thereof, characterized in that:
said bob comprising a hollow inner shell enclosed by a hollow outer shell;
said outer shell being a substantially cylindrical shape with a bulbous section on a top portion thereof, a small opening projecting from a top end and said outer shell containing a rubber grommet for receiving a lower end of said spindle therein;
said inner shell being inserted into an opening at a lower end of said outer shell and being extensible with respect to said outer shell;
said inner shell being a substantially cylindrical shape and a circular rubber plug being disposed on a top end thereof, said circuit rubber plug contacting closely with an inner surface of said outer shell and provides a snug water tight fit, a scale also being provided on an outer surface of said inner shell; and
said tail being attached to a lower aperture of said inner shell.

4,944,114
FISH ATTRACTOR AND BUG KILLER
Charlie E. Burton, 3423 Colgate, Tyler, Tex. 75701, and James H. McKay, Rt. 2, Box 19, Flint, Tex. 75762
Filed Jan. 27, 1989, Ser. No. 302,824
Int. Cl.[5] A01M 1/04; A01K 5/00
U.S. Cl. 43—113 1 Claim

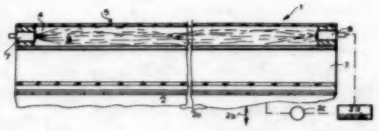


1. A fish feeding device comprised of a plastic dome having a closed top and open bottom, the closed top having a hanger for suspension, the open bottom containing a light source and an electric motor with a shaft having a flexible cord attached, the flexible cord extending past the light source for scattering insect parts over the water for feeding fish.

4,944,115
PROCESS FOR THE MULTIPLICATION OF PLANT VARIETIES AND PRODUCTS OBTAINED THEREBY
Sergio Patrucco, Diano San Pietro, Italy, assignor to 501 Patrucco Due Co. S.R.L., S.N., San Peitro, Italy
Filed Aug. 10, 1988, Ser. No. 230,772
Claims priority, application Italy, Aug. 10, 1987, 48286 A/87
Int. Cl.[5] A01G 1/00
U.S. Cl. 47—7 12 Claims

1. A process for the multiplication of plant varieties of comprising the following operations: (a) grafting of the variety to be reproduced on a tendril of a rooted mother plant at various levels and leaving the mother plant for time sufficient for the grafting to join to the rooted mother plant; (b) cutting said tendril grafted according to operation (a) from said rooted mother plant above and below said grafting levels to produce cuttings; and (c) rooting said cuttings obtained from operation (b).

4,944,116
SENSOR STRIP
Franz Mewald, Teesdorf, Austria, assignor to Mewald Gesellschaft m.b.H., Pottendorf, Austria
Filed Aug. 30, 1989, Ser. No. 400,557
Claims priority, application Austria, Sep. 1, 1988, 2139/88
Int. Cl.[5] E05F 15/20
U.S. Cl. 49—27 10 Claims

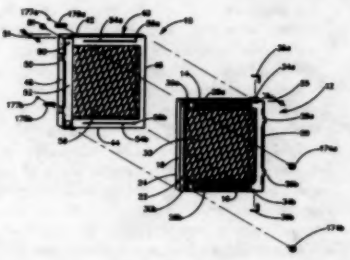


1. A sensing strip for a movable member having an edge and a drive for said movable member, said sensing element comprising:
an elongated hollow elastically deformable body extending along said edge;
a support connecting said body to said edge and extending therealong;
a hollow light guide profile formed in said body at a side thereof opposite said support and constituting a leading edge portion with said hollow body, said hollow light guide profile being provided with a slit within said body whereby a light from said light beam traversing said hollow light guide profiles can escape upon spreading of said slit;
a light source generating said light beam at one end of said body directing said light beam into said hollow light guide profiles; and
a light receiver operatively connected to said drive for controlling same and disposed to receive said light beam in an undeformed state of said body, whereby a deformation force applied to said body spreads said slit and reduces light reaching said receiver.

4,944,117
FOOTHOLD SECURITY GATE

Albert W. Gebhard, Denver; Roy E. Knoedler, Boulder; Robert M. Parker, Aurora, and William G. Au, Northglenn, all of Colo., assignors to Gerico, Inc., Denver, Colo.

Filed Aug. 30, 1988, Ser. No. 238,621
Int. Cl.[5] E06B 7/00
U.S. Cl. 49—55 11 Claims



1. A friction-mountable security gate for gating an area, comprising:

panel means having a center for at least partly covering the area;

at least one block movably attached to said panel means and movable from a first position substantially proximate to said panel means to at least a second position extended in a direction away from said center of said panel means;

first means attached to said panel means for moving said block from said first position to said second position, said first means including foot activatable means wherein said block is moved from said first position to said second position in response to said foot activatable means being depressed by a foot;

second means, being activated at substantially the same time as said foot activatable means, for releasing said block from said second position;

third means for releasably locking said block in said second position wherein said block is automatically locked when said block is moved to said second position;

fourth means for moving said block by storing energy when said foot activatable means is used to move said block from said first position to said second position; and

fifth means for engaging said third means and for moving said block away from said second position wherein at least part of said stored energy is used for said movement away from said second position.

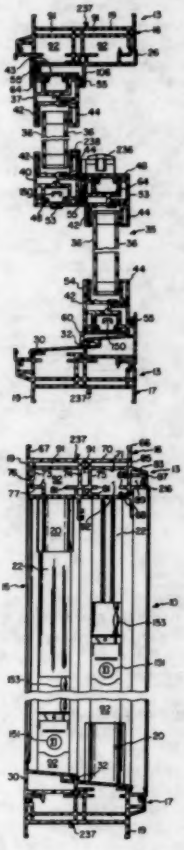
4,944,118
WELDED WINDOW CONSTRUCTION

Alexander J. Biro, Gibsonia, Pa., assignor to Chelsea Industries, Inc., Boston, Mass.

Filed Jan. 19, 1989, Ser. No. 299,879
Int. Cl.[5] E06B 7/16
U.S. Cl. 49—504 35 Claims

1. A low profile window comprising:

(a) a window frame of a polymeric material including at least two parallel side jambs, a head jamb extending perpendicular to and connecting at welded miter joints the upper ends of the side jambs and a bottom sill extending perpendicular to and connecting at welded miter joints the lower ends of the side jambs; said side jambs, said head and said bottom sill are formed of a common master frame and window frame inserts that snap into said common master frame, said master frame in cross-section having a first sidewall and a shorter second sidewall spaced parallel thereto; first and second spaced parallel connecting walls transverse to and joining said first sidewall and said second sidewall; first, second and third spaced parallel support walls extending perpendicularly from said first connecting wall and parallel to said first and second sidewalls, said first support wall adjacent said second sidewall and projecting from said first connecting wall through said second connecting wall to said second sidewall, said second support wall and said third support wall positioned parallel and adjacent one another and extending from a middle portion of said first connecting wall through said second connecting wall and terminating beyond said second connecting wall and said second support wall terminating short of said third support wall; an end section extending between and connecting said terminal ends of said first support wall and said second sidewall to form a



shelf therebetween; an L-shaped flange protruding from said end section and directed toward said second support wall; a crosspiece connecting said third support wall and said second support wall at the terminal end thereof and projecting beyond sides of said second and third support walls; a traingular shaped extension extending from a point of intersection of said second connecting wall and said first sidewall, said triangular extension having a protruding channel sidewall connected thereto and parallel to said first sidewall and terminating at a distance approximately equivalent to the projection of said first sidewall; said first and second connecting walls, said first and second sidewalls and said first, second and third support walls, end section, crosspiece and triangular shaped exten-

sion cooperatively forming said master frame cross section; and

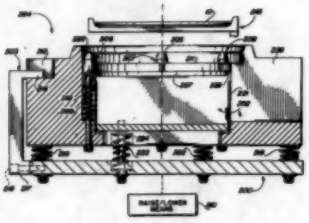
(b) at least one sash of a polymeric material and including a glazing having outer peripheral edges, at least two parallel side stiles, a top rail extending perpendicular to and connecting at welded miter joints the upper ends of the side stiles and a bottom rail extending perpendicular to and connecting at welding miter joints the lower ends of the side stiles to completely enclose the outer peripheral edges of said glazing, said top rail, said side stiles and said bottom rail constructed from a common master sash and at least one sash insert, said common master sash generally having a double wall h-shape cross-section and a plurality of sash crosspieces extending between said double walls of said master sash to reinforce said master sash such that said at least one sash insert in cooperation with said master sash surrounds the outer peripheral edges of said glazing to form said sash, said sash confined within said window frame to produce said low profile window.

4,944,119

APPARATUS FOR TRANSPORTING WAFER TO AND FROM POLISHING HEAD

Gerald L. Gill, Jr., Phoenix, and Thomas C. Hyde, Chandler, both of Ariz., assignors to Westech Systems, Inc., Phoenix, Ariz.

Filed Jun. 20, 1988, Ser. No. 208,685
Int. Cl.[5] B24B *41/06*
U.S. Cl. 51—215 R **8 Claims**



1. Transport apparatus for transporting a wafer into position for polishing by polishing apparatus, said wafer including

a peripheral edge circumscribing said wafer and including a first portion and a second portion, and

spaced apart top and bottom surfaces each terminating at said edge,

said polishing apparatus including

at least one station having a polishing surface,

a frame,

elongate carrier means mounted on said frame, and

a pressure head mounted on said elongate carrier means, said elongate carrier means moving said pressure head between at least two operative positions,

a first operative position with said head positioned over said transport apparatus, and

a second operative position with said head positioned over said station,

said pressure head including a lower portion for maintaining said wafer in contact therewith and against said polishing surface when said pressure head is positioned over said station, said transport apparatus including

(a) a transport head assembly;

(b) displacement means for upwardly displacing said transport head assembly;

(c) a wafer dolly having an elongate tongue to support said wafer such that said second portion of said peripheral edge extends outwardly away from and free of said tongue;

(d) means for positioning said wafer on said tongue such that said second portion of said peripheral edge extends outwardly away from and free of said tongue; and

(e) means for positioning said wafer dolly with said elongate tongue extending over and in a selected position above said transport head assembly, said transport head assembly including

(i) a base,

(ii) an alignment cup mounted on said base and having

a support surface shaped and dimensioned to receive and support said second portion of said wafer to support said wafer in a selected orientation, and

a wall structure defining a central opening formed in said alignment cup intermediate and extending downwardly from said support surface and shaped and dimensioned to receive said tongue,

(iii) a plurality of spaced apart upstanding pins mounted on said base for contacting said second portion to permit said wafer to slide intermediate said pins downwardly toward said support surface, said pins circumscribing said central opening and said support surface;

said central opening, support surface and pins being shaped and dimensioned such that when said tongue is in said selected operative position over said transport head assembly and said displacement means upwardly displaces said transport head assembly toward said tongue, said wafer slides intermediate said pins onto said support surface while said structure and support surface move upwardly past said tongue, and,

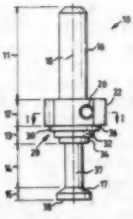
(iv) means for upwardly displacing said support surface to position said wafer adjacent said lower portion of said pressure head when said pressure head is in said first operative position.

4,944,120

DOP FOR GEMSTONE HANDLING DURING MANUFACTURE

Ilan Weisman, 52 Brener Street, Herzelia; Roni Shapira, Moshav Givat-Chen, Ranana; Roni Shafir, 9 Leon Blum Street, Ramat-Aviv, and Hanoh Shtark, 23 Lamerchav Street, Ramat Hasaron, all of Israel

Filed Jun. 16, 1989, Ser. No. 366,928
Claims priority, application Israel, Jun. 16, 1988, 86761
Int. Cl.[5] B24B *49/00*
U.S. Cl. 51—165.72 **40 Claims**



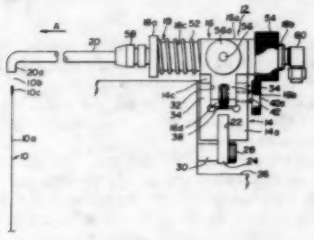
1. A dop for handling a gemstone comprising:

an elongate shaft having shank and gripper portions located at respective ends thereof, and a shaped portion provided therebetween on the shaft and defining a plurality of externally sensible features for providing information uniquely identifying the dop and for establishing its spatial orientation and that of the gemstone.

4,944,121
COOLANT SUPPLY NOZZLE APPARATUS FOR SLICING MACHINE

Hiroyuki Takahashi, and Yoshitaka Shiratori, both of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 255,826
Claims priority, application Japan, Oct. 16, 1987, 62-158601[U]
Int. Cl.[5] B24B *55/02*; B26D *7/10*; B05B *15/08*
U.S. Cl. 51—267 9 Claims



1. A coolant supply nozzle apparatus for directing a coolant to an inner peripheral cutting edge of an annular disk blade rotating about an axis thereof, comprising:

a body including a pivot shaft disposed so as to extend axially of said blade;

a first mobile member pivotally mounted on said shaft;

a second mobile member mounted on said first mobile member so as to be movable in a direction parallel to said shaft;

a nozzle tube mounted on said second mobile member and having an opening end adapted to be directed toward the cutting edge of said blade, said opening end being shifted from said pivot shaft radially of said shaft;

first positioning means for positioning said second mobile member in place, and comprising

(i) pivoting means for causing said first mobile member to pivot about said pivot shaft, and

(ii) stopper means for stopping said first mobile member in place; and

second positioning means for positioning said second mobile member in place;

said first mobile member being supported by the pivot shaft for pivotal movement to move the nozzle in a plane perpendicular to the axis of the blade while maintaining the position of the nozzle in an axial direction of the blade;

said second mobile member being supported by the first mobile member for movement in a direction parallel to said shaft to move the nozzle axially of the blade while maintaining the position of the nozzle in a plane perpendicular to the axis of said blade;

wherein said pivoting means of said first positioning means comprises

(i) urging means interposed between said body and said first mobile member for urging said first mobile member to pivot about said pivot shaft in a prescribed direction, and

(ii) an adjusting screw threadedly mounted on said body for causing said first mobile member to pivot about said pivot shaft in a direction opposite to said prescribed direction against the urging force of said urging means.

4,944,122
HORIZONTALLY ORIENTED DEMOUNTABLE PARTITION SYSTEM

Alan C. Wendt, 249 S. Poteet Rd., Barrington, Ill. 60010

Filed Oct. 4, 1988, Ser. No. 253,161
Int. Cl.[5] A47B *5/00*
U.S. Cl. 52—36 9 Claims

1. A partition construction comprising:

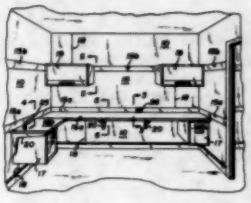
a substructure;

a runner extending generally axially horizontal, overlying and affixed to the substructure, the runner having upper and lower, spaced apart, generally parallel edges and further comprising

first panel edge engaging means disposed along the upper runner edge,

second panel edge engaging means disposed along the lower runner edge,

a runner web disposed between the upper and lower runner edge, the web and upper and lower runner edges forming a recess,



means disposed along the recess for engaging a cap, a first wall panel disposed above the runner and having a lower edge engaging the first edge engaging means of the runner;

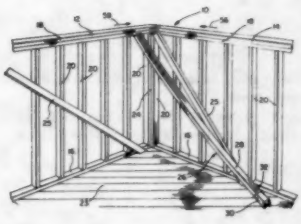
a second wall panel disposed below the runner and having an upper edge engaging the second edge engaging means of the runner; and

a cap extending along the runner web and engaging the cap engaging means of the runner.

4,944,123
CONSTRUCTION PROP BASE

David Larrieu, 1936 Novato Blvd., Novato, Calif. 94901

Filed Jul. 14, 1989, Ser. No. 379,619
Int. Cl.[5] E04G *21/26*
U.S. Cl. 52—127.2 3 Claims



1. An inclined wall framing top plate-to-subfloor push stick incorporating an elongated, stiff prop member having first and second upper and lower ends, said first end including endwise outwardly facing abutment surface means for abutting engagement with a first wall frame top plate adjacent one end thereof adjoining a second wall frame disposed at an angle relative to said first wall frame, said second end including subfloor surface engaging means for non-slip engagement with and penetration of a subfloor upper surface spaced from said first wall frame against slipping of said subfloor surface engaging means relatively to said subfloor away from said first wall frame, but enabling shifting of said subfloor surface engaging means over said subfloor upper surface toward said first wall frame and subsequent non-slip re-engagement with and penetration of said subfloor upper surface, said elongated, stiff prop member being somewhat flexive and including physical characteristics

enabling said prop member to be longitudinally bowed in a first vertical plane containing said prop member, but resisting longitudinal bowing of said prop member in a second plane containing said prop member and disposed normal to said first plane, said subfloor surface engaging means including an end member telescoped over said second end and of said prop member, said end member comprising a rectangular tubular member telescoped over and secured to said second end and including an end wall abutted against the terminal end face of said second end, said end member including endwise outwardly projecting teeth extending outward beyond said end wall.

4,944,124

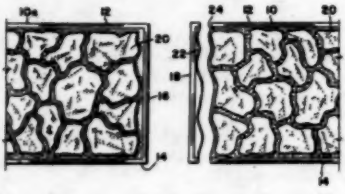
DECORATIVE PANEL WITH CUTLINE

Larry Armstrong, Eufaula, Okla., assignor to Reil Rock Products, Inc., Eufaula, Okla.

Continuation of Ser. No. 91,387, Aug. 31, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 371,124

Int. Cl.[5] B60R *27/00*

U.S. Cl. 52—169.12 **2 Claims**



1. A molded rectangular panel for use as skirting on a mobile home or the like, comprising a panel having a raised and detailed masonry surface in the form of a rock pattern, a portion of the masonry surface adjacent one end of the panel terminating along a line which constitutes a cutline or a line of severance for that end such that a given panel, when the end is severed along the cutline, can be placed in overlapping relationship with an adjacent panel of the same design such that the interruption of the masonry pattern appears to be avoided.

4,944,125

FILTERING DEVICE

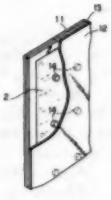
Yoshio Ito, Kurume, Japan, assignor to Tabai Espec Corporation, Osaka, Japan

Filed May 3, 1989, Ser. No. 346,842

Claims priority, application Japan, May 9, 1988, 63-112044

Int. Cl.[5] A01G *9/24*

U.S. Cl. 52—171 **17 Claims**



1. A filtering device comprising a mixture and a container for holding the mixture, the mixture containing water, a compound dissociable into ferrous salt ions, and at least one of L-ascorbic acid and D-ascorbic acid, the container comprising transparent members disposed face to face with each other, with the mixture confined therebetween.

4,944,126

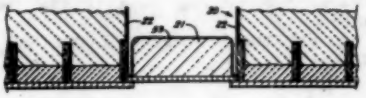
ATTIC INSULATING SYSTEM

Gregory J. King, 5473 Logan St. SE., Rochester, Minn. 55904

Filed Nov. 30, 1989, Ser. No. 443,318

Int. Cl.[5] E06B *6/26*

U.S. Cl. 52—202 **6 Claims**



1. A system for insulating attics wherein access to the attic is had through an opening in the floor of the attic, which opening is normally closed by a trap door, comprising:

(a) an adjustably expandable guard, said guard being adjustable to a size and shape corresponding to the size and shape of said opening;

(b) means for securing said guard in surrounding and upwardly extending relation to said opening; and

(c) a trap door insulating pack comprising a harness enclosing one or more layers of insulating material, said pack being attachable to said trap door such that said pack overlies essentially all said trap door.

4,944,127

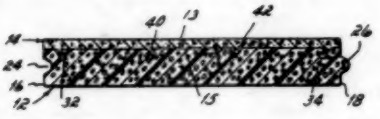
COMPOSITE BUILDING PANEL AND METHODS

Theodore E. Clear, Hamilton, Ohio, assignor to The Dow Chemical Company, Mich.

Continuation of Ser. No. 911,124, Sep. 24, 1986, abandoned. This application Sep. 14, 1989, Ser. No. 407,233

Int. Cl.[5] E04C *1/00*

U.S. Cl. 52—309.12 **7 Claims**



1. A composite building panel of the type including a foam layer and an overlying protective cementitious layer, each of said layers having a facing surface abutting the facing surface of the adjacent layer, and said foam layer having longitudinal edges extending from one end of the panel to another end, the improvement including:

said cementitious layer having an outer planar surface, an inner facing surface and perpendicular edges, said outer planar surface extending to and perpendicularly intersecting adjacent edges;

said foam layer having inner and outer surfaces and perpendicular edges, said inner foam layer surface disposed against said inner facing surface of said cementitious layer and extending to and perpendicularly engaging adjacent edges of said foam layer;

said edges of said foam and cementitious layers being coextensive;

an elongated, substantially continuous inclined outer groove formed in said foam layer inner surface at least adjacent and extending along each respective longitudinal edge thereof;

elongated inclined grooves formed in said inner surface of said foam layer internally of said outer groove;

said grooves having parallel side walls, each side wall inclined at an acute angle with respect to the inner facing surface of said foam layer, said grooves all extending to the same depth in said foam layer;

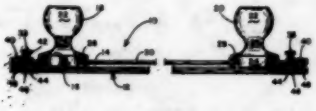
means comprising integral portions of said cementitious layer filling said grooves, for providing a mechanical grip between said cementitious layer and said foam layer, and for providing a moisture barrier to prevent ingress of moisture between said two inner facing surfaces internally of said grooves to inhibit moisture related delamination of said layers.

4,944,128

HAND SANDER WITH AUTOMATIC SLACK TAKE-UP FEATURE

John P. Reiter, 10407 Quebec Ave. S., Bloomington, Minn. 55438

Filed Jul. 10, 1989, Ser. No. 377,113
Int. Cl.[5] B24D *15/08*
U.S. Cl. 51—363 **6 Claims**



1. Sanding apparatus for finishing both plane and curved surfaces comprising:

(a) a generally rectangular flexible base member having first and second major surfaces;

(b) hand grip means affixed to said first major surface;

(c) a strip of material sufficiently thin to permit flexure thereof mounted on said base member and overlaying said first major surface and including clamping means disposed at each end of said strip for releasably clamping opposed ends of a flexible generally rectangular sheet of abrasive material with the sheet of abrasive material extending over and backed-up by said second major surface of said base member; and

(d) tensioning means disposed between said first major surface of said base strip of material and said means mounted on said base member for maintaining said sheet of abrasive material in contact with said second major surface irrespective of whether said base member is flexed to conform to a convex or a concave curved surface, said tensioning means including a first pair of wedge members affixed to said strip and a second pair of wedge members affixed to said first major surface and located in contact with said first pair of wedge members such that flexure of said base member and said strip results in a change in separation of said strip relative to said base member.

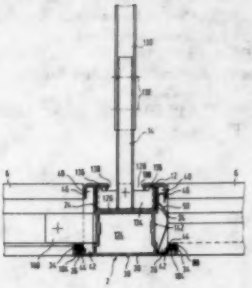
4,944,129

CEILING LINING

Karl-Heinz Hartleif, Reilingen, Fed. Rep. of Germany, assignor to Hartleif Metalldecken GmbH, Hockenheim, Fed. Rep. of Germany

PCT No. PCT/EP88/00735, § 371 Date May 23, 1989, § 102(e) Date May 23, 1989, PCT Pub. No. WO89/01551, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 17, 1988, Ser. No. 347,802
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 8711244
Int. Cl.[5] E04B *5/52*
U.S. Cl. 52—486 **23 Claims**

1. Ceiling lining of metal, comprising a supporting grid and cassettes arranged in grid compartments of the supporting grid which is composed of longitudinal struts and of transverse struts connected to said longitudinal struts, each longitudinal strut and each transverse strut having projections which are arranged on either side at lower ends of said struts and which extend in the longitudinal directions thereof, are provided with seals, the cassettes resting upon said seals in a tight sealing engagement therewith, the longitudinal struts being designed as essentially rectangular hollow profiles, characterized in that the hollow profile is designed in the form of a closed duct and that further the longitudinal strut has a region of substantially hollow cross-section for mounting suspension elements, the duct is arranged in the middle section of the longitudinal strut and the region of the substantially hollow cross-section is arranged above said duct, said region of the substantially hollow cross-section is substantially U-shaped such that suspension elements can be suspended therein, the longitudinal strut is



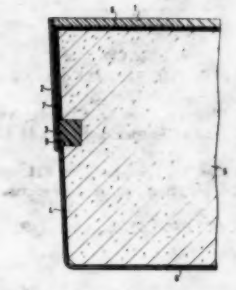
substantially rectangular in cross-section and comprises a horizontal separating web for separating the duct from the region of substantially hollow cross-section, the cassette has a circumferential step-like fold extending along its lower outer edge and resting with a horizontal surface of said step-like fold upon the projections in such manner that bottom portions of the cassette, the longitudinal strut and the transverse strut are substantially co-planar, and spring members are mounted on longitudinal struts or on transverse struts to secure the cassettes in position.

4,944,130

FLOOR TILE

Sebald Pallhorn, Goldbach, Fed. Rep. of Germany, assignor to Goldbach GmbH, Holz-, Kunststoff- und Metallverarbeitung, Goldbach, Fed. Rep. of Germany

Filed May 23, 1989, Ser. No. 355,970
Claims priority, application Fed. Rep. of Germany, May 25, 1988, 8806800
Int. Cl.[5] E04C *2/38*
U.S. Cl. 52—802 **5 Claims**



1. A floor tile for double floor installations with a tile core having a floor covering on its top side, a metal plate on its underside and a lipping on its peripheral edge, wherein the peripheral edge is provided with at least one groove (9) which is to receive hot-melt adhesive (3), the metal plate (8) has an

upward edge (4) which grips around the peripheral edge, reaches up to the lower rim of the groove (9) and is flush with a first lipping (7), and a second lipping (2), which covers the groove (9) and a part of the upward edge (4) of the metal plate (8), is located on top of the first lipping (7).

4,944,131

PAPER FOLDING APPARATUS

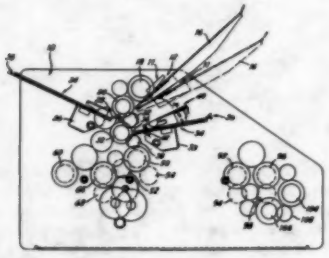
Rex M. K. Gough, Cambridge, United Kingdom, assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 7, 1989, Ser. No. 334,966

Claims priority, application United Kingdom, Apr. 8, 1988, 8808313; May 6, 1988, 8810698

Int. Cl.[5] B65B *43/26, 51/02, 63/04*

U.S. Cl. 53—117 **9 Claims**



1. Paper folding apparatus including control means for controlling the operation of the machine, means for transporting a stationery item along a paper path, a buckle chute having opposed end regions of which one is generally open to a folding chute arranged in use to receive a portion of said stationery item to effect a fold therein and the other end includes deflector means arranged in use to deflect an oncoming stationery item to continue along said path, location means for reversibly locating the buckle chute adjacent said paper path with either said open end or said deflector means presented to said path and orientation detection means associated with said location means for determining which of said open end and deflector means are presented to said path and for outputting a signal to said control means.

4,944,132

APPARATUS FOR THE STERILE PACKAGING OF CONTENTS

Lars C. Carlsson, Blentarp; Sven O. S. Stark, Ystad, and Ulf Bengtsson, Dalby, all of Sweden, assignors to AB Tetra Pak, Lund, Sweden

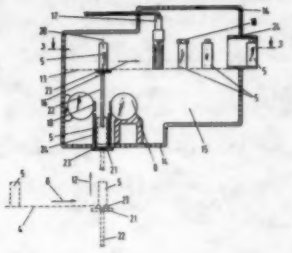
Filed Mar. 10, 1989, Ser. No. 321,980

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808058

Int. Cl.[5] B65B *55/02;* **A61L** *2/00*

U.S. Cl. 53—167 **7 Claims**

1. An apparatus for sterile packaging, which comprises in combination an inlet sluice with irradiating means for sterilizing performed empty containers, said inlet sluice being in the form of a tunnel, means for filling sterile empty containers, and means for sealing filled sterile containers, said inlet sluice with irradiating means for sterilizing empty containers, means for filling sterile empty containers and means for sealing filled sterile containers being located in the interior of a common sterile enclosure, said apparatus including conveying means for elevating the empty containers through said tunnel and delivering to said irradiating means and sterile enclosure, and conveying means for carrying filled sealed containers from said sterile enclosure.



4,944,133

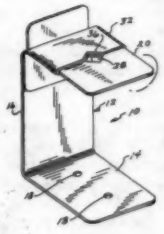
APPARATUS FOR FORMING BAIT SACKS

James V. Mause, 621 Rogers, Fort Atkinson, Wis. 53538

Filed Nov. 25, 1987, Ser. No. 125,133

Int. Cl.[5] B65B *67/06*

U.S. Cl. 53—390 **4 Claims**



1. An apparatus for use in preparing bait sacks comprising:

a base member adapted for securement to a structure and having an upwardly extending arm,

a first plate member including means to pivotally attach said first plate member to an upwardly distal portion of said arm and movable between a first position in which said plate member is disposed in a substantially horizontal plane and a second position in which said plate member is disposed in a substantially vertical plane with said first member spaced from said base member in both of said first and second positions and

a second member including means to slideably dispose said second member about said first plate member and movable between a first position in which the configuration of said member provides an opening and a second position in which said opening is substantially closed.

4,944,134

METHOD OF FORMING A RECLOSABLE PACKAGE

Paul E. Grindrod, Madison, and Gerald O. Hustad, McFarland, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

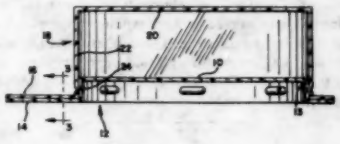
Filed Feb. 2, 1989, Ser. No. 305,876

Int. Cl.[5] B65B *7/02, 31/02;* **B65D** *73/00*

U.S. Cl. 53—432 **24 Claims**

11. A method of forming a vacuumized, hermetically sealed package which is characterized by a predetermined quantity of a product arrange dint eh from of an upright mass on a raised panel portion of a semi-rigid base, which base has peripherally

extending flange margins sealed to corresponding flange margins of a body member of a semi-rigid preformed plastic; said body member having a top panel for engaging the upper end of said product and depending side walls for engaging the side walls of said product, and the bottom edges of said body side walls being in telescoping relationship with portions of said base at the peripheral edges of said raised panel portion; said method comprising supporting said preformed body member in inverted position with the flanged margins thereof on the edge portions of a rigid upwardly opening hollow form, placing a sufficient quantity of said product in said body member to substantially fill said body member when the package is completed, positioning said base on the mouth of said body member with said product engaging panel disposed so as to telescope into said body member and engage with said product and with the flanged margins of said base overlying the corresponding margins of said body member, vacuumizing the assembly and hermetically sealing the package, wherein the package further contains a locking means contained in the base and body member side walls for snap locking the base to the body member, said locking means provides for friction interference fit, and postforming said locking means at temperatures below the melting point range but above about the glass transition temperature.



4,944,135

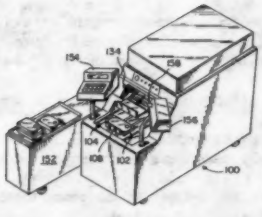
PACKAGE WRAPPING AND WEIGHING SYSTEM

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 87,924, Aug. 21, 1987, Pat. No. 4,825,626. This application Mar. 14, 1989, Ser. No. 323,582

Int. Cl.[5] B65B *11/18*

U.S. Cl. 53—502 **6 Claims**



1. Packaging machine comprising an input station for receiving packages to be wrapped, a wrapping station for wrapping packages placed into said input station, an output station for discharging packages wrapped at said wrapping station, first conveying means for transporting said packages from said input station to said wrapping station, second conveying means for transporting said packages from said wrapping station to said output station, sensing means for sensing the presence of a package at said input station and generating a package sensing signal, and drive means responsive to said package sensing signal for causing operation of said machine for a sufficient number of cycles to wrap and discharge said package; characterized in that said drive means comprises means for stopping said first conveying means after said package arrives at said wrapping station and restarting said first conveying means in synchronism with the operation of said wrapping station upon receipt of a new package sensing signal.

4,944,136

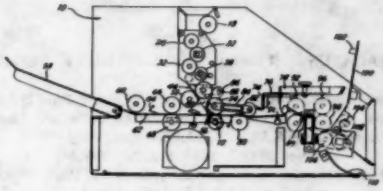
PAPER HANDLING APPARATUS

Rex M. K. Gough, Cambridge, United Kingdom, assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 7, 1989, Ser. No. 335,164

Int. Cl.[5] B65B *43/26, 63/04, 67/00*

U.S. Cl. 53—493 **12 Claims**



1. A folder inserter machine including transport means for transporting a partially folded primary insert from a second insert station and along a transport path, control means for controlling said transport means to interrupt and re-establish operation of said transport means, guide tray means arranged adjacent said second insert station for inserting a second insert, and switch means associated with said guide tray means for communicating with said control means whereby re-establishment of the operation of said transport means occurs on actuation of said switch means, so that passage of the partially folded primary insert is interrupted pending manual insertion of the second insert and is re-established only when said switch means has been operated.

4,944,137

DEVICE FOR OPENING ENVELOPE BODIES, AND FOR FILLING THEM

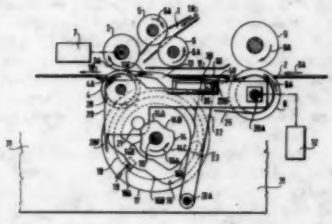
Marek Krasuski, Fontenay Aux Roses, and Bernard Prugnolle, Pantin, both of France, assignors to Societe Anonyme dite: Alcatel Satmam, Bagneux, France

Filed Jul. 17, 1989, Ser. No. 380,343

Claims priority, application France, Jul. 27, 1988, 88 10122

Int. Cl.[5] B65B *43/26*

U.S. Cl. 53—569 **16 Claims**



1. In a device for opening envelope bodies for filling for use in an insertion machine constituting means defining a mail path and in which each envelope body to be filled is held in a filling position facing said mail path, said device including opening fingers coupled to actuator means and control means coupled to said actuator means in order to move the opening fingers between a retracted position and an opening position facing an

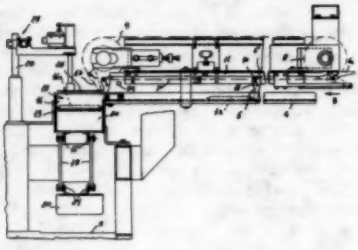
envelope in said filling position, the improvement wherein the device includes a finger shaft extending across said mail path, a preassembled assembly formed on said finger shaft, said preassembled assembly including said opening fingers mounted to rotate freely on said finger shaft about said shaft axis, longitudinal positioning first means on opposite sides of each finger for longitudinally positioning said fingers on said shaft, resilient abutment second means extending on the same side of said finger shaft for each finger between said longitudinally positioning first means, and wherein said device further includes a guide plate mounted facing said assembly and opposing the action of said second means on said fingers biasing said fingers against one face of said guide plate and guiding the fingers against said one face.

4,944,138

APPARATUS FOR GROUPING BAGS DISPENSED BY AN AUTOMATIC DEVICE

Franco Alsoia, Bologna, and Renato Piccinini, Sala Bolognese, both of Italy, assignors to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed May 2, 1988, Ser. No. 189,441
Claims priority, application Italy, May 13, 1987, 3478 A/87
Int. Cl.[5] B65B *35/40, 39/14*
U.S. Cl. 53—540 **3 Claims**



1. Apparatus for grouping bags dispensed by an automatic device, comprising:

a station for receiving bags dispensed by said automatic device in a stack formed of a selected number of bags;

a conveyor having successive housings and adapted to move step by step below said station, said step corresponding to the distance between two adjacent housings of said conveyor, said housings being adapted to receive said bags from said station;

means for extracting said stacks of said bags from said conveyor housings and means for packing said stacks;

said station defining at least two seats, said seats being disposed side by side at a distance equal to said distance between two adjacent housings of said conveyor, each of said seats being arranged over one of said conveyor housings in order that said at least two seats are respectively arranged over two of said housings when said conveyor is not moving;

an expeller adapted to eject said stacks of bags from said station and to introduce said stacks into said conveyor housings;

control means adapted to operate said expeller synchronously with said conveyor in order that when a preset number of said bags filled each of said seats to form said stack, an empty housing of said conveyor is arranged below each of said seats; said expeller being subsequently operated to fill each of said empty housings with a respective one of said stacks; said conveyor being subsequently operated to move forward by a preset number of steps until said housings filled with said stacks are moved beyond said station and successive empty conveyor housings are disposed below respective ones of said seats of said station; while said conveyor is being moved forward by said preset number of steps, said seats of said station are being filled with said preset number of bags, said preset number of steps corresponding to said preset number of bags forming each of said stacks; said expeller being subsequently operated to fill and empty conveyor housings with said stacks of bags,

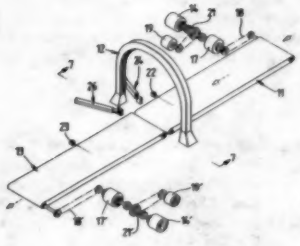
wherein each of said station seats comprises a pair of angular elements, each of said angular elements having a side portion and a bottom portion, said bottom portion of each of said pair of said angular elements being disposed face to face, a middle open portion being defined by said bottom portions of said pair of angular elements, said bottom portions of said angular elements being adapted to support at least one of said bags; said expeller comprising a pusher part adapted to insert into said open portion in order to push said bag stack through said open portion to eject said bag stack from said station and to introduce said stack into one end of said conveyor housings.

4,944,139

STRAPPER STOP APPARATUS

Robert F. Neilsen, and Peter Hiebert, both of Birmingham, Ala., assignors to Neilsen & Hiebert Systems, Inc., Birmingham, Ala.

Filed Oct. 3, 1988, Ser. No. 252,772
Int. Cl.[5] B65B *13/06, 57/16*
U.S. Cl. 53—599 **13 Claims**



1. A method for accurately positioning an article on a driven conveyor relative to a fixed reference while performing an operation on said article comprising the steps of:

(a) moving the article toward said reference point on a conveyor driven in a forward direction by a primary feed motor;

(b) sensing the position of the article proximal said fixed reference;

(c) reducing the speed of said conveyor;

(d) diagonally extending a stop member from alongside said conveyor to a position above said conveyor to engage an article and stop the forward movement thereof at a predetermined point relative to said fixed reference;

(e) sensing the engagement of an article with said stop member;

(f) performing said operation response to engagement of said article with said stop member; and

(g) releasing said article from said stop member for further movement on said conveyor;

(h) sensing the position of said article at a second position relative to said fixed reference;

(i) reversing the direction of said conveyor;

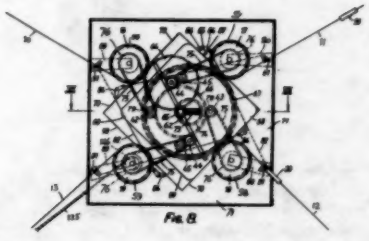
(j) displacing a second stop member from alongside said conveyor to a position above said conveyor to engage said article and stop the reverse movement thereof at a second predetermined point relative to said fixed reference;

(k) sensing the engagement of said article with said second stop member;

(l) performing said operation responsive to engagement of said article with said second stop member;
(m) and releasing said article for further movement on said conveyor in its original direction of travel.

4,944,140
GUIDANCE SYSTEM FOR A SELF-PROPELLED MACHINE

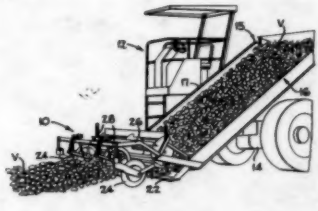
Richard L. Donaghey, The Paddocks, Gadlys Road, Llanmaes, Nr. Llantwit Major, South Glamorgan, United Kingdom
Continuation of Ser. No. 832,086, Feb. 24, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,329
Claims priority, application United Kingdom, Feb. 26, 1985, 8504889
Int. Cl.[5] A01D *34/63*
U.S. Cl. 56—10.2 **8 Claims**



1. A self-propelled machine, including an automatic guidance system comprising a plurality of cables extending from the machine to anchorage points on the ground spaced apart in two orthogonal directions, and control means on the machine for controlling the cables to cause the machine to move around a multi-sided track defining a progressively changing area.

4,944,141
HEIGHT CONTROL SYSTEM

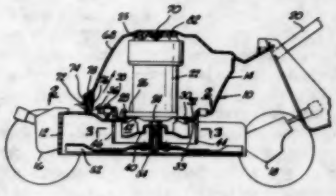
Franklin P. Orlando, Morgan Hill; Lee D. Butler, Kingsburg; Donald A. Luttrell, and Joseph S. Goulart, Santa Clara, all of Calif., assignors to FMC Corporation, Chicago, Ill.
Filed Dec. 9, 1988, Ser. No. 281,732
Int. Cl.[5] A01D *34/28*
U.S. Cl. 56—17.1 **36 Claims**



1. An apparatus for maintaining the desired level relative to the ground of at least one vertically movable harvesting component of a ground supported mobile harvester when harvesting a crop growing on ground which varies in elevation, comprising:
means for supporting said at least one vertically movable component for substantially vertical movement on said harvester;
means for detecting variations in the level of the ground and plants forwardly of said at least one vertically movable harvesting component;
at least one power means for moving said at least one vertically movable harvesting component downwardly in response to detecting a depression in the ground and upwardly in response to detecting a rise in the ground;
at least two lightweight wheels supported on the harvester and rising on the crop and ground forwardly of said vertically movable harvesting component;
control means independently responsive to changes in elevation of said at least two lightweight wheels in either direction relative to a variable but generally planar ground level for maintaining said at least one vertically movable component at desired levels relative to the variable ground level; and
means for momentarily interrupting the signal to said at least one power means in response to said at least two lightweight wheels riding over small articles on said generally planar surface for precluding upward movement of said components.

4,944,142
POWER LAWNMOWER CONSTRUCTION

Hiroshi Sueshige; Akitsugu Inokawa, both of Powell, and William Bezilla, Marysville, all of Ohio, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 22, 1988, Ser. No. 234,857
Int. Cl.[5] A01D *34/67*
U.S. Cl. 56—320.1 **36 Claims**



1. A lawnmower comprising:
a body;
a power source mounted to said body;
a vertical drive shaft extending downwardly from said power source;
a cutter mounted to said shaft;
a fan mounted to said shaft between said power source and said cutter, said fan having radial flow fan blades defining a central inlet inwardly of said blades and directly below said power source;
a cutter scroll mounted to said body, said scroll including a cylinder wall concentrically disposed about said shaft outwardly of said fan and having its lower edge located above said cutter, and
a plurality of openings positioned directly radially outwardly of said fan extending through said cylindrical wall.

9. A lawnmower comprising
a body;
a power source mounted on said body;
a cover positioned on said body and extending at the periphery thereof to said body to define a chamber above said body;

an opening in said cover about a portion of the periphery thereof;

an air filter positioned in said opening and extending in vibration damping relation between said cover and said body.

4,944,143

SPEED CONTROL MEANS AND APPARATUS FOR A REPEATABLE MATERIAL PROCESSING APPARATUS

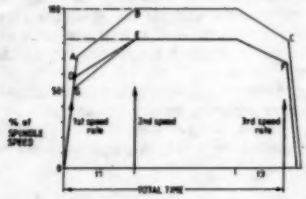
Akira Tanaka, 4-28 Mandai Higashi 3-chome, Sumiyoshi-ku, Osaka, Japan

Filed Dec. 5, 1988, Ser. No. 279,949

Claims priority, application Japan, Dec. 4, 1987, 62-308420; Dec. 4, 1987, 62-308421

Int. Cl.[5] D01H *1/26*

U.S. Cl. 57—93 **5 Claims**



1. A repeatable finite quantity material processing apparatus which includes a driving motor which determines the process speed and a speed control apparatus including:

first preselecting means for preselecting an optimum operating speed (B) of the driving motor;

second preselecting means for preselecting a starting speed (A) as a preselected percentage of the optimum operating speed (B);

third preselecting means for preselecting a total time period (T) for the completion of the finite quantity process;

fourth preselecting means for preselecting a speed change time period (al) for the change from the starting speed (A) to the operating speed (B) as a preselected percentage of the total time period (T); and

an automatic processor for receiving signals from the four preselecting means and arranged to change the speed of the driving motor between the starting speed and the operating speed in a series of very small increments during the preselected speed change time period.

4,944,144

SPINDLE DRIVING DEVICE OF COVERING MACHINE

Tadao Kato, Ishikawa; Akira Yamagiwa, Kanazawa, and Ichi Matsuoka, Matsuto, all of Japan, assignors to Kabushiki Kaisha Ishikawa Seisakusho, Ltd., Kanazawa, Japan

Filed May 17, 1989, Ser. No. 352,943

Int. Cl.[5] D01H *13/00*

U.S. Cl. 57—105 **6 Claims**

1. A spindle driving device for a covering machine, comprising:

a frame;

a plurality of groups of spindles mounted on the frame, each group of spindles having a predetermined number of spindles and a motor associated therewith;

a spindle-wharve installed on each spindle;

a driving pulley removably installed on each motor, a diameter of the driving pulley being determined according to a necessary speed of revolution of the spindles;

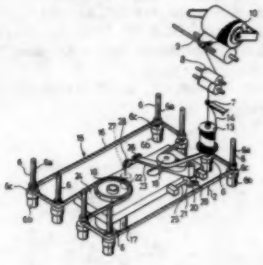
a tension pulley associated with each group of spindles;

an endless belt associated with each group of spindles the endless belt of each group being stretched around the driving pulley, the spindle-wharves and the tension pulley in the respective group;

an arm associated with each group, each arm having the tension pulley of that group mounted at an approximate center thereof;

a pivot supporting one end of each arm, the arm being rotatable around the pivot;

a slider connected to each pivot, said slider being slidable on



a guide-rod and being adapted to be fixed at a suitable position along the guide-rod in order to obtain a proper tension in the endless belt, the guide-rod permitting displacement of the slider, the pivot, the arm and the tension pulley in a direction for adjusting the tension in the endless belt;

an energizing member for biasing an opposite end of the arm in a direction adapted to remove slackness in the endless belt.

4,944,145

SPINNING MACHINE FOR PRODUCING FEEDING PACKAGES FOR TWISTING

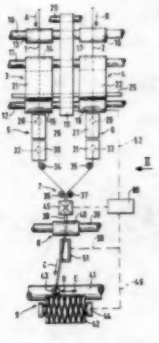
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Filed May 11, 1989, Ser. No. 350,404

Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817493

Int. Cl.[5] D01H *1/115, 5/28, 15/00*

U.S. Cl. 57—261 **10 Claims**



1. A spinning machine arrangement for producing yarn packages used as feeding packages for subsequent twisting operations, comprising:

drafting means for drafting two yarn components,

false twisting means for false twisting the two yarn components,

windup means for winding up the two yarn components as a double yarn on a spool package,

yarn quality monitoring means for monitoring the quality of the yarn components.

spinning operation interrupting means for interrupting the spinning operation in response to detection of a yarn quality defect by the yarn quality monitoring means.

windup operation interrupting means for interrupting the operation of the windup means to cause stoppage of a partially wound package in response to the detection of a yarn quality defect by the yarn quality monitoring means,

and a program control unit means including means for automatically controlling the spinning operation interrupting means and the windup operation interrupting means with coordination of the timing of the spinning interruption and the windup interruption and stoppage of the partially wound spool package to facilitate minimal waste of fiber material and assure location of the yarn end at a defined point for subsequent piecing.

4,944,146

METHOD TO CONVEY ROVING PACKAGES WITH THE ROVING PREPOSITIONED

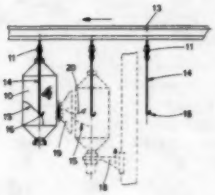
Enzo Scaglia, Via Monte Rosa 21, Milano, Italy 20149

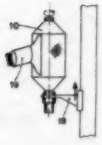
Filed Apr. 5, 1989, Ser. No. 333,535

Claims priority, application Italy, Apr. 27, 1988, 83374 A/88

Int. Cl.[5] D01H *9/18*

U.S. Cl. 57—281 **8 Claims**





1. Method of automatically positioning a roving package for feeding a roving to a spinning machine comprising:

(a) removing the roving package from a package production machine,

(b) removing an end portion of the roving from the roving package,

(c) transferring the roving package to a package support, wherein said package support is connected to a conveyor means,

(d) positioning the end portion of the roving onto a roving support substantially during the step of transferring the roving package to the conveyor means, and

(e) conveying the roving package to a working position on the spinning machine.

4,944,147

APPARATUS FOR FORMING HORSE SHOES

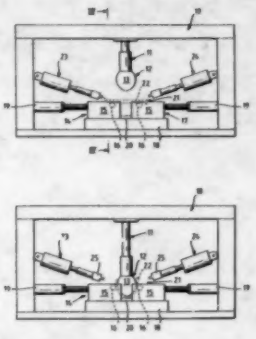
Patrick J. Finnegan, 9 Parsonage Close, Kircubbin, County Down BT22 2 RZ, Ireland

PCT No. PCT/GB86/00745, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/04208, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 8, 1986, Ser. No. 259,569

Int. Cl.[5] B21K *15/02*

U.S. Cl. 59—56 **7 Claims**



1. Apparatus for forming horse shoes comprising a hydraulic press having a ram and a cylinder, means to operate said press, a horse shoe former securable to the outer end of the ram or cylinder of the press, the former to engage, in use, with at least one blank of fullered horse shoe iron bar, an anvil against which the, or each, blank is deformed into a substantial U-shape by extension of said ram, and means on each side of, and on movement towards, said anvil to cause the outer ends of the, or each, deformed blank to be bent around said former, the former having at least one plate with an angled periphery over its forming peripheral surface to engage a sloped face of a respective blank to locate and correctly position said blank relative thereto and to the anvil.

4,944,148

METHOD AND A DEVICE FOR COOLING OF A PFBC POWER PLANT AFTER A GAS TURBINE TRIP

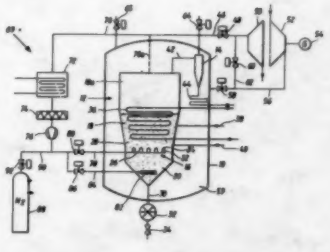
Lennart Hjalmarsson, Finspong, Sweden, assignor to ABB Stal AB, Sweden

Filed Dec. 23, 1988, Ser. No. 289,271

Claims priority, application Sweden, Dec. 23, 1987, 8705152

Int. Cl.[5] F02C *3/26*

U.S. Cl. 60—39.02 **3 Claims**



1. A method of cooling a bed material in a bed of a combus-

tor in the event of an operational disturbance in the turbine unit of a PFBC power plant, including the steps of:

cooling the gas leaving the combustor, in a gas cooler located in a separate closed cooling circuit formed by the combustor, the gas cooler, a gas circulator and conduits forming interconnections therebetween; and

returning the cooled gas to the combustor.

4,944,149

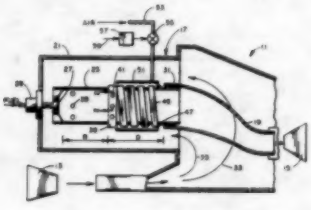
COMBUSTOR LINER WITH AIR STAGING FOR NOX CONTROL

Masayoshi Kuwata, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1988, Ser. No. 284,226

Int. Cl.[5] F23R *3/26*

U.S. Cl. 60—39.23 **24 Claims**



1. A cylindrical combustor liner including an upstream portion comprising a reaction zone and downstream portion comprising a dilution zone; a first plurality of dilution air holes disposed through the liner for admitting air into the dilution zone and a first plurality of combustion air holes for admittng air into the reaction zone; and, means for covering and uncovering one of the pluralitity of dilution air holes or the combustion air holes for regulating the flow of air through the dilution air holes and the combustion air holes into the combustor liner, said means being operative to increase air flow through the dilution air holes and to decrease air flow to the reaction zone upon a decrease in load and fuel flow to an associated combustor.

4,944,150

PFBC POWER PLANT

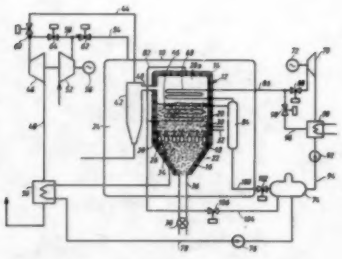
Sven-Olov Östman, Finspong, Sweden, assignor to ABB Stal AB, Sweden

Filed Jan. 18, 1989, Ser. No. 298,089

Claims priority, application Sweden, Jan. 18, 1988, 8800140

Int. Cl.[5] F02C *3/26, 6/18*

U.S. Cl. 60—39.182 **4 Claims**



1. A power plant burning a fuel at a pressure considerably exceeding the atmospheric pressure in a fluidized bed comprising:

a combustor with water-cooled walls which form a feed water preheater;

an evaporator provided within said combustor and having tubes which absorb heat from the fluidized bed and cool said bed;

at least one superheater arranged in said combustor;

a drain conduit connected to a feed water conduit between the preheater wall and the evaporator; and

a drain valve provided in said drain conduit for draining part of the feed water flow, thus maintaining the generation of steam in the evaporator substantially under all operating conditions and in case of a load drop out.

4,944,151

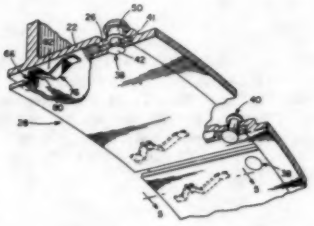
SEGMENTED COMBUSTOR PANEL

Camer V. Hovnanian, Fairfield, Conn., assignor to Avco Corporation, Providence, R.I.

Continuation of Ser. No. 249,455, Sep. 26, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 445,119

Int. Cl.[5] F23R *3/60*

U.S. Cl. 60—39.32 **16 Claims**



11. In a combustion chamber for a gas turbine engine, the improvement comprising:

a generally cylindrically configured outer shell having a longitudinal axis and a plurality of annular lands lying in planes transverse to said axis and at spaced locations along said axis;

a plurality of axially spaced concentrically disposed segmented liner panels arranged in side by side circumferential relationship, each of said liner panels having a leading portion, a trailing portion, and opposed lateral portions extending, respectively, between said leading portion and said trailing portion,

first mounting means for fixedly attaching each of said liner panels to an associated one of said annular lands at a first location proximate to said leading portion such that said first location of said liner panel is thereby denied axial, radial, and circumferential movement relative to said outer shell;

second mounting means for attaching each of said liner panels to said associated annular land at a second location distant from said first location but proximate to said leading portion such that radial, axial and circumferential movement of said liner panel relative to said outer shell is permitted; and

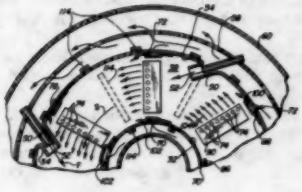
third mounting means for attaching each of said liner panels to said outer shell at a third location proximate to said trailing portion such that said third location of said liner panel is thereby held at a spaced distance away from said outer shell and restrained against radial movement relative to said outer shell while axial and circumferential movement of said liner panel relative to said outer shell are permitted.

4,944,152

AUGMENTED TURBINE COMBUSTOR COOLING

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 11, 1988, Ser. No. 255,965
Int. Cl.[5] F23R *3/02*
U.S. Cl. 60—39.36 6 Claims



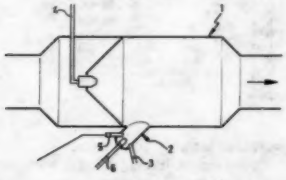
1. A turbine engine comprising:
a rotary compressor;
a turbine wheel rotatable about an axis and coupled to the rotary compressor to drive the same;
a nozzle for directing gases of combustion at said turbine wheel to cause the same to rotate;
an annular combustor centered on said axis and having an outlet connected to said nozzle, said combustor having at least one wall having an interior side and an exterior side and provided with spaced rows of apertures to produce a film of cooling air on said interior side from air entering said combustor through said apertures;
a plenum substantially surrounding said combustor and in fluid communication with said compressor and for delivering compressed air therefrom to said apertures; and
trip strips on said exterior side between said rows of apertures and directed toward, but not to, said plenum, said trip strips being located to minimize the temperature gradient between spaced locations located in turn between adjacent rows of apertures.

4,944,153

BURNER FOR HARD-TO-IGNITE MIXTURES

Dieter Goerlich, Emmering; Rainer Kolodzie, and Rainer Reiter, both of Munich, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,292
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1987, 3728712
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—303 11 Claims



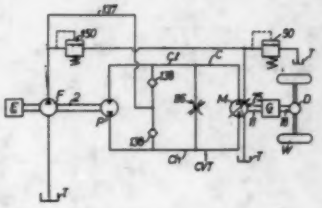
1. Burner for a hard-to-ignite mixture, such as exhaust gases of an internal combustion engine, comprising a main burner to which only fuel is supplied to the mixture and an ignition means for providing sufficient energy for ignition of the main burner; wherein said ignition means comprises an air supply device for creation of a local zone of an easy-to-combust mixture and an ignition device for producing a flame therefrom, and control means for turning off said air supply device once ignition of said main burner is achieved.

4,944,154

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Eiichiro Kawahara; Kenichi Ikejiri; Mitsumasa Furumoto, and Noboru Yamamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,418
Claims priority, application Japan, Dec. 9, 1986, 61-293069
Int. Cl.[5] F01B *13/04*; F16D *37/00*
U.S. Cl. 60—488 9 Claims



1. A hydraulically operated continuously variable transmission comprising:
an output shaft;
a hydraulic motor coupled to said output shaft and having a motor swash plate and a motor cylinder supporting an annular array of slidable motor plungers held in slidable contact with said motor swash plate;
a distribution member integral with said motor cylinder;
an input shaft;
a hydraulic pump coupled to said input shaft in sliding contact with said distribution member and having a pump swash plate movable with said motor cylinder and a pump cylinder supporting an annular array of slidable pump plungers held in slidable contact with said pump swash plate;
a closed hydraulic circuit inteconnecting said hydraulic pump and said hydraulic motor;
said pump cylinder being coaxially surrounded by said motor cylinder with a hydraulically hermetic chamber defined therebetween;
a replenishing pump operatively coupled to said input shaft and connected to said closed hydraulic circuit through a replenishing oil passage, said replenishing oil passage partly extending in said distribution member;
said distribution member having an oil passage defined therein and interconnecting said replenishing oil passage and said hydraulically hermetic chamber; and
a relief valve disposed in said oil passage in said distribution member, said relief valve being openable when the pressure of oil in said replenishing oil passage exceeds a prescribed level.

4,944,155

VACUUM SEPARATOR FOR DEWAR FLASK COLD EXCHANGE SYSTEMS

David K. Alexander, Indianapolis, Ind., assignor to Kadel Engineering Corporation, Danville, Ind.

Filed Jun. 14, 1989, Ser. No. 366,184
Int. Cl.[5] F17C *1/00*
U.S. Cl. 62—45.1 7 Claims

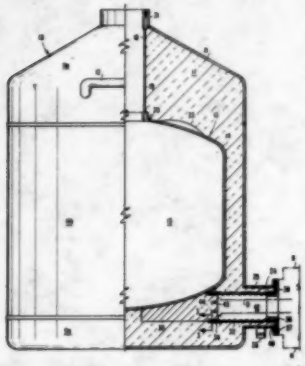
1. A cold exchange system for cooling a device in a device housing comprising:
a Dewar flask including;
an inner vessel for containing a cryogenic liquid;
an outer vessel joined to and surrounding said inner vessel and defining a first evacuable chamber therebetween;
an evaporation port through said inner vessel and said outer vessel through which the cryogenic liquid can evaporate;
a device port through said outer vessel; and

means for sealingly engaging the device housing to said outer vessel in communication with said device port;

a cold finger in heat transfer relation with said inner vessel;

a vacuum separator including;

a flexible non-metallic bellows having open ends, sealingly engaged at one of said ends to said cold finger and at the



other of said ends to said outer vessel in communication with said device port, whereby said non-metallic bellows and the device housing define a second evacuable chamber separate from said first evacuable chamber; and

means for mounting the device to be cooled within said bellows in direct mechanical contact and heat transfer relation with said cold finger.

4,944,156

AIR CONDITIONING SYSTEM INTO WHICH A REFRIGERATOR OR A WARMING CABINET IS INTEGRATED, AND POWER SOURCE CIRCUIT THEREFOR

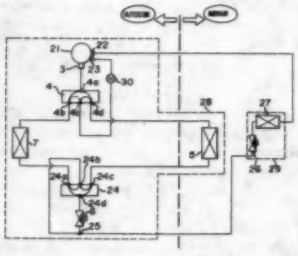
Katsuharu Yamamoto, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,273

Claims priority, application Japan, Dec. 23, 1987, 62-325751; Aug. 3, 1988, 63-193078

Int. Cl.[5] F25B *27/00*

U.S. Cl. 62—324.6 **9 Claims**



1. A system comprising:

(a) a compressor;

(b) a refrigerator;

(c) an indoor heat exchanger;

(d) an outdoor heat exchanger;

(e) a first valve having a first, a second, a third, and a fourth connecting port;

(f) a second valve having a first, a second, a third, and a fourth connecting port;

(g) an expansion valve;

(h) a first path of fluid communication linking said compressor to said first connecting port of said first valve;

(i) a second path of fluid communication linking said second connecting port of said first valve to said outdoor heat exchanger;

(j) a third path of fluid communication linking said outdoor heat exchanger to said first connecting port of said second valve;

(k) a fourth path of fluid communication linking said second connecting port of said second valve to said expansion valve;

(l) a fifth path of fluid communication linking said expansion valve to said first connecting port of said second valve;

(m) a sixth path of fluid communication linking said fourth connecting port of said second valve to said indoor heat exchanger;

(n) a seventh path of fluid communication linking said expansion valve to said refrigerator;

(o) an eighth path of fluid communication linking said refrigerator to said compressor;

(p) a ninth path of fluid communication linking said third connecting port of said first valve to said compressor; and

(q) a tenth path of fluid communication linking said fourth connecting port of said first valve to said indoor heat exchanger.

4,944,157

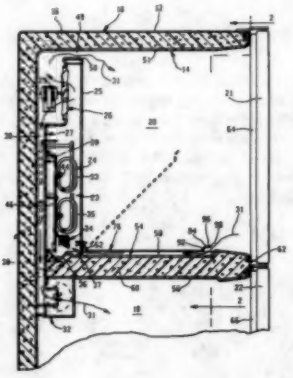
REFRIGERATOR FREEZER COMPARTMENT FLOOR COVERING ASSEMBLY

Thomas E. Jenkins, and David G. Beers, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 7, 1989, Ser. No. 376,436

Int. Cl.[5] F25D *17/04*

U.S. Cl. 62—407 **4 Claims**



1. A refrigerator assembly comprising:

a freezer compartment having a rear wall, top wall, side walls, bottom wall and an open front,

an evaporator unit mounted in a space in front of the rear wall,

a vertical panel separating the evaporator unit from the rest of the freezer compartment to form an evaporator compartment between the panel and rear wall,

a plurality of upwardly open grooves in the bottom wall of the freezer compartment extending from the front section of the freezer compartment under the vertical panel and into the evaporator compartment, and

a cover hingedly connected to the panel for movement to a

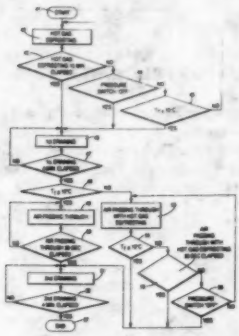
raised position above the bottom wall for access to the grooves in the bottom wall and to a lowered position horizontal to the bottom wall.

4,944,158

METHOD OF DEFROSTING A REFRIGERATING CIRCUIT FOR USE IN COOLING A VEHICULAR CHAMBER

Shigeru Akiike, Isesaki, and Yuuji Rikukawa, Gunma, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 27, 1989, Ser. No. 315,575
Claims priority, application Japan, Feb. 26, 1988, 63-42319
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—81 **12 Claims**



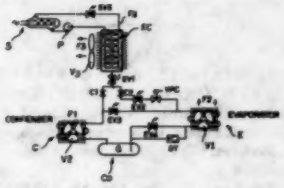
1. In a refrigerating circuit for use in cooling a vehicular chamber including a compressor, a condenser for condensing refrigerant gas discharged from said compressor, an expansion valve for expanding condensed refrigerant flowing from said condenser, a cooling unit having an evaporator and a fan disposed within the vehicular chamber to be cooled, and a controlled valve member for selectively switching a course of a flow of refrigerant gas discharged from said compressor in order to directly lead said discharged refrigerant gas to said evaporator, said fan for causing air in said vehicular chamber to pass through said evaporator, a method for defrosting a frost formed at said cooling unit comprising a first step of defrosting a frost formed at an outer surface of said evaporator by directly leading said discharged refrigerant gas to said evaporator and a second step of defrosting a frost formed at said cooling unit in addition to said evaporator by causing air in the vehicular chamber to pass through said evaporator, said first step being initiated when a command signal for defrosting a frost formed at said cooling unit is generated, said first step being terminated at the earlier point in time either of when the duration of operation of said first step exceeds a first predetermined period of time or when a temperature of an outer surface of said evaporator reaches or exceeds a predetermined value, said second step being initiated in operation after said first step is terminated, said second step being terminated when the duration of operation of said secnd step exceeds a second predetermined period of time.

4,944,159

PROCESS FOR PRODUCING COLD BY SOLID-GAS REACTION AND DEVICE PERTAINING THERETO

Georges Crozat, Perpignan, France, assignor to Falveley Entreprises, Saint-Ouen and Societe Nationale Elf Aquitaine, Courbevoie, both of, France

PCT No. PCT/FR88/00255, § 371 Date Mar. 22, 1989, § 102(e) Date Mar. 22, 1989, PCT Pub. No. WO88/09465, PCT Pub. Date Dec. 1, 1988
PCT Filed May 20, 1988, Ser. No. 315,683
Claims priority, application France, May 22, 1987, 87 07209
Int. Cl.[5] F25B *15/00*
U.S. Cl. 62—112 **18 Claims**



1. A method for producing cold by means of a device comprising at least a reactor (R, R1, R2, R3) which contains a solid compound capable of reacting with a gas according to an exothermic reaction, this reactor being connected via one single isolation valve by separate circuits to a condenser (C) and an evaporator (E) which is in a heat exchange relationship with an enclosure to be cooled, the condenser (C) and the evaporator (E) being respectively connected by separate lines to a gas collector (Co), the interior of the reactor being in a heat exchange relationship with an external heat source (S), wherein the following simultaneous reactions are carried out in the reactor (R, R1, R2, R3):

$$<X,mNH_3> = n(NH_3) \rightarrow <X,(m+n)\,NH_3>$$
$$n[NH_3] \rightarrow n(NH_3)$$
$$\text{then } <X,(m+n)\,NH_3> \rightarrow <X,mNH_3> + n(NH_3)$$
$$n(NH_3) \rightarrow n[NH_3]$$

the symbols < >, [] and () denoting the solid, liquid and gaseous states respectively,

X being chosen from $ZnCl_2$, $CuSO_4$, CuCl, LiBr, LiCl, $ZnSO_4$, $SrCl_2$, $MnCl_2$, $FeCl_2$, $MgCl_2$, $CaCl_2$ and $NiCl_2$, and wherein, for the purpose of producing cold down to −40° C. in the enclosure to be refrigerated, the maximum temperature outside the latter being not more than 30° C., an external heat source (S) is employed, whose temperature is higher than a value Th, m and n being integers and Th having a value such that: for:

$X = ZnCl_2(m = 2, n = 2)$	$T_h = 139°$ C.
$X = CuSO_4(m = 4, n = 1)$	$T_h = 145°$ C.
$X = CuCl(m = 1, n = 0.5)$	$T_h = 151°$ C.
$X = LiBr(m = 2, n = 1)$	$T_h = 155°$ C.
$X = LiCl(m = 1, n = 1)$	$T_h = 167°$ C.
$X = ZnSO_4(m = 3, n = 1)$	$T_h = 173°$ C.
$X = SrCl_2(m = 0, n = 1)$	$T_h = 173°$ C.
$X = MnCl_2(m = 2, n = 4)$	$T_h = 174°$ C.
$X = LiCl(m = 0, n = 1)$	$T_h = 203°$ C.
$X = FeCl_2(m = 2, n = 4)$	$T_h = 208°$ C.
$X = MgCl_2(m = 4, n = 2)$	$T_h = 217°$ C.
$X = CuSO_4(m = 2, n = 2)$	$T_h = 230°$ C.
$X = ZnSO_4(m = 2, n = 1)$	$T_h = 247°$ C.
$X = CaCl_2(m = 1, n = 1)$	$T_h = 265°$ C.
$X = NiCl_2(m = 2, n = 4)$	$T_h = 282°$ C.

4,944,160

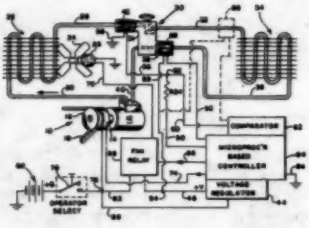
THERMOSTATIC EXPANSION VALVE WITH ELECTRONIC CONTROLLER

Peter J. Malone, Elk Grove Village; Michael B. Thompson, Hoffman Estates; Robert J. Torrence, Addison, and Marvin F. Gaudette, Rockton, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 31, 1990, Ser. No. 473,066

Int. Cl.[5] F25D *17/00*

U.S. Cl. 62—180 **4 Claims**



1. A refrigerant control system comprising:

(a) pump means including condenser means providing a source of pressurized liquid refrigerant;

(b) expansion valve means with a body having an inlet and outlet including conduit means operative to communicate pressurized liquid refrigerant from said pump means to the inlet thereof and having a valve member disposed in said body and movable therein for controlling flow of said liquid to said outlet for expansion;

(c) blower means operative for circulating air over said condenser means;

(d) evaporator means having an inlet and outlet and connected for receiving refrigerant flow at the inlet thereof from the outlet of said valve means and operative to absorb heat from a compartment to be refrigerated and effect vaporization of said refrigerant for discharge at the outlet thereof;

(e) said valve means body including a continuous passage therethrough connected to receive refrigerant flow from said evaporator means outlet and discharge refrigerant flow to the inlet of said pump means;

(f) said valve means further including actuator means responsive to the temperature of the refrigerant in said continuous passage operable for moving said valve member;

(g) first thermistor means disposed in said inlet of said valve means body and including current limiting resistance means electrically in series with said thermistor means;

(h) first circuit means operative to provide a flow of current to said thermistor means sufficient to cause boiling of refrigerant coming into contact therewith including means operative to determine the temperature of said flow at said boiling;

(i) second circuit means operative to compare said temperature with saturation values in a look-up table and convert said temperature to saturation pressure, said second circuit means operative to cycle said blower means responsive to said pressure;

(j) second thermistor means disposed at the outlet of said evaporator for sensing the temperature of the flow of refrigerant thereof; and

(k) second circuit means receiving a signal from said second thermistor means and operative to energize said pump means when said sensed temperature is greater than a predetermined "ON" temperature and operative to deenergize said pump means when said sensed temperature is less than a predetermined "OFF" temperature.

4,944,161

APPARATUS FOR FREEZING LIQUID-CARRYING PIPES

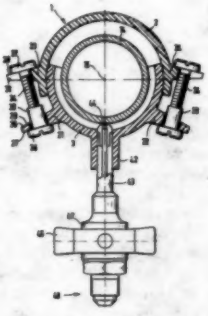
Josephus A. Van Der Sanden, Lange Voren 14, NL-5521 DD Eersel, Netherlands

Filed Feb. 23, 1989, Ser. No. 313,860

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 8802515[U]

Int. Cl.[5] F25D *3/00*

U.S. Cl. 62—293 **9 Claims**



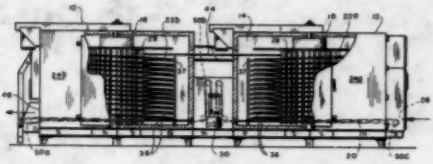
1. Apparatus for freezing liquid-carrying pipes, the apparatus comprising an annular casing having an inwardly open cross section, supply line means for supplying a refrigerant to an interior of the casing, valve means provided in said supply line means, said casing including a first casing part and a second casing part directly fixed together at right angles to a longitudinal center axis of the casing, each of said first and second casing parts including end walls spaced by jacket wall means, and wherein a carbon dioxide supply lance means is inserted in one of the first and second casing parts, the carbon dioxide supply lance means includes an end face having an opening adapted to be brought into contact with an exterior surface of the liquid carrying pipe so as to enable carbon dioxide to pass directly onto the liquid carrying pipe and over a circumference thereof.

4,944,162

HELICAL CONVEYOR FOOD FREEZER

Gary D. Lang, Naperville, and Brian E. Sink, Orland Park, both of Ill., assignors to Liquid Carbonic Corporation, Chicago, Ill.

Filed Nov. 7, 1989, Ser. No. 432,594
Int. Cl.[5] F25D *25/04*
U.S. Cl. 62—380 13 Claims



1. A food freezer comprising an insulated enclosure for maintaining temperatures below ambient temperatures therewithin,

means forming an entrance and an exit in said enclosure,

an endless conveyor belt for carrying products throughout said enclosure from said entrance to said exit,

means for driving said conveyor belt so that said endless conveyor belt follows along an initial straight-line path section and then along at least one helical path section, with such helical path portion constituting a significant portion of said belt's total pathway,

cooling means for establishing a temperature within said enclosure sufficiently low to satisfactorily remove heat from products carried along said conveyor,

said belt having a plurality of horizontal rods extending laterally across said belt which rods are interconnected by means including a plurality of support surface-providing units, said interconnecting means being constructed so that, during change of belt orientation at the transition from said straight-line path section to said helical path section, the pitch between the inner ends of said rods remains constant whereas the pitch between the outer ends of said rods expands,

said conveyor belt driving means including at least one cylindrical cage supported for rotation about a vertical axis, said cage having a plurality of equidistantly spaced apart vertical drive elements located circumferentially around said cage, each of said drive elements having at least one radially and vertically extending drive surface, said drive surfaces being spaced apart on a pitch which is the same as said constant pitch at said inner ends of said rods, and

said rods having protruding heads at the laterally inner ends thereof, which heads are engaged by said drive surfaces to positively drive said belt throughout its helical path.

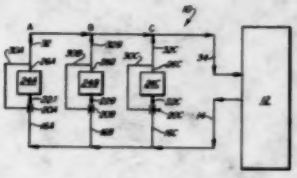
4,944,163

FLOW CONTROL APPARATUS AND METHOD

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 129,449, Dec. 7, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 336,595
Int. Cl.[5] F25B *1/06*
U.S. Cl. 62—500 4 Claims

1. A method of operating a cavitating venturi for fluid flow control in a thermal management system having an evaporator with a wet vapor exhaust, the venturi having an inlet section, a constricted section including a throat, and a diffusion section comprising regulating the pressure of a vaporous cavitation



bubble downstream of the venturi throat to the pressure of said wet vapor exhaust of said evaporator.

4,944,164

CONVERTIBLE EARRING

Janis Y. Butler, R.D.8-372 Union Valley Rd., Mahopac, N.Y. 10541, and Esther Fuhrman, P.O. Box 342, Jenkintown, Pa. 19046

Filed Jul. 26, 1989, Ser. No. 385,723
Int. Cl.[5] A44C *7/00*
U.S. Cl. 63—12 28 Claims

1. A convertible earring comprising:

(A) a rigid earring body having a surface on one side and ear attachment means on the other side;

(B) said surface having a raised portion and an adjacent decorated portion; whereby

(C) when said earring body is attached to one ear by said ear attachment means, said raised portion hides said adjacent decorated portion behind said raised portion when said earring body is viewed from the front of the ear; and

(D) when said earring body is attached to the other ear by said ear attachment means, said adjacent decorated portion is visible in front of said raised portion when viewed from the front of the other ear;

(E) said earring body thereby being convertible to a more decorated earring body when viewed from the front of an ear by switching the attachment of said earring body from one ear to the other.

4,944,165

DEVICE FOR THE WASHING OF FABRIC BY MACHINE

Antonius C. G. Leebeek, Brussels, and James P. Johnston, Overijse, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 10, 1989, Ser. No. 309,448
Claims priority, application France, Feb. 11, 1988, 88 01658
Int. Cl.[5] D06F *39/02*
U.S. Cl. 68—17 R 9 Claims

1. A device for releasing liquid and solid constituents of a washing agent into a washing bath including a main body interrupted by a filling orifice and a port for progressively releasing liquid detergent from within said main body into the

fabric during washing, wherein the improvement comprises: a solid product including soluble additive ingredients useful for

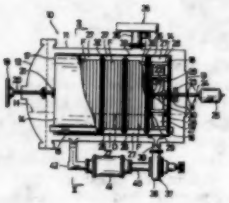
washing and a means for supporting and retaining said solid product on the exterior of said main body as said additive ingredient dissolves during washing.

4,944,166

DYEING APPARATUS

Yoshimichi Yamakita, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 391,963
Claims priority, application Japan, Aug. 15, 1988, 63-202840
Int. Cl.[5] D06B *3/04*
U.S. Cl. 68—157 4 Claims



1. A dyeing apparatus for dyeing fabric materials with different colors which comprises:

(a) a horizontally mounted cylindrical vessel having a dished cover at one end and a rear end wall at the opposite end;

(b) a non-perforated cylindrical beam having both ends closed by end walls and concentrically mounted within said vessel and non-rotatively supported on rails, said beam having a plurality of partitions extending parallel and coextensive with said end walls and defining therebetween a plurality of dye chambers;

(c) a rotary shaft extending rotatably in bearings axially through said partitions;

(d) a plurality of winding frame members extending parallel with said rotary shaft and connected rotatably therewith by radially extending connecting bars;

(e) a drive motor having a drive shaft releasably connected to said rotary shaft;

(f) a pressure fluid reserve tank externally supported on and communicating with said vessel; and

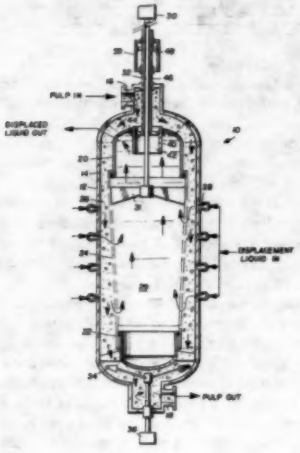
(g) a heat medium supply externally mounted on and communicating with said vessel.

4,944,167

BACKFLUSHING PRESSURE DIFFUSER SCREENS

Finn Jacobsen, and Ole J. Richter, both of Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden

Division of Ser. No. 233,366, Aug. 18, 1988, Pat. No. 4,908,896, which is a continuation-in-part of Ser. No. 125,710, Nov. 27, 1987, Pat. No. 4,793,161. This application Nov. 9, 1989, Ser. No. 433,794
Int. Cl.[5] D21D *5/02*
U.S. Cl. 68—181 R 8 Claims



1. A pulp treating apparatus comprising:

a generally upright, liquid-tight, pressurized vessel defining a first interior volume for containing pulp to be treated under pressure;

a pulp inlet to the vessel;

a pulp outlet from the vessel, the pulp flowing generally vertically between said pulp inlet and said pulp outlet;

a screen defining a surface of revolution upstanding within the vessel and defining, in part, said interior volume containing pulp and having upper and lower ends of different cross-sectional area;

extraction means for withdrawing liquid from the pulp, through said screen, and including means defining a second interior volume within the vessel for receiving the extracted liquid;

means for vertically moving said screen to effect a major part of backflushing action; and

additional screen backflushing means mounted within the vessel and including a chamber defining element having first and second ends, the first end lying in communication with liquid in said second interior volume, and the second end lying in open communication with the pulp within said first interior volume of the vessel; a piston mounted within said chamber defining element for reciprocal movement therein and means for moving said piston in said chamber defining element towards said first end to cause said piston to force liquid out of the chamber and to provide an increase volume for the pulp in said first interior volume, and resulting in reduction of any shock effect of the backflushing.

4,944,168

CABLE LOCK

Ludger Kortenbrede, Telgte, Fed. Rep. of Germany, assignor to Aug. Winkhaus GmbH & Co. KG, Fed. Rep. of Germany

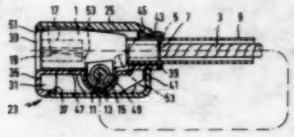
Filed Jul. 24, 1989, Ser. No. 384,746

Claims priority, application Fed. Rep. of Germany, May 18, 1989, 8906146

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] F05B *67/06*

U.S. Cl. 70—49 **11 Claims**



1. A cable lock comprising

an elongated lock body (1),

a flexible cable portion (3), having a first end (5) secured to the lock body (1) so that it extends in the longitudinal direction of the lock body (1) and having a second end (11) removably secured to the lock body (1) crosswise to the longitudinal direction of said lock body (1), and,

a casing (25, 31) enclosing the lock body (1) and having apertures (27, 29) for the two ends (5, 11) of the cable portion (3) and consisting of a synthetic plastic material, said casing (25, 31) comprising an outer casing part (25) being constructed as a tubular cap (25) and an inner casing part (31) fitted into the outer casing part (25) in the longitudinal direction of the lock body (1), said outer casing part (25) annularly enclosing the inner casing part (31) at least over a portion of its longitudinal dimension,

mutually complementary snap-action members (43, 45) disposed in the region of one of the ends of the outer casing part (25) seen in the longitudinal direction of the lock body, one of the snap-action members being constructed as a radially open annular groove (43) disposed in the plane extending substantially at rightangles to the longitudinal direction of the lock body (1) while the other snap-action member is constructed as an annular shoulder (45) adapted to snap into place in the annular groove (43).

4,944,169

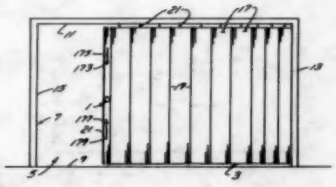
CLOSURE LOCK

H. M. Robert Labelle, Cornwall; Norman H. Cant, Bainsville, both of Canada, and Cecil M. Garrow, Hogansburg, N.Y., assignors to Martinray Industries Ltd., Cornwall, Canada

Filed Dec. 20, 1989, Ser. No. 453,792

Int. Cl.[5] E05B *65/08*; E05C *1/02*

U.S. Cl. 70—100 **10 Claims**



1. A closure lock for a closure of the type having a tubular post at its leading end, the closure lock having two locking bar assemblies mounted within the post, each locking bar assembly having a locking bar at one end and a strap at the other end, the locking bars projecting in opposite directions and the straps overlapping, each locking bar assembly movable longitudinally within the post between a locked position where the locking bar projects from the post and an unlocked position where the locking bar is withdrawn in the post; a locking pin within the middle of the post and movable transversely of the post between a locked and unlocked position, the locking pin, in its locked position cooperating with the overlapped straps of the locking bar assemblies, when they are in their locked position, to prevent longitudinal movement of the locking bar assemblies within the post.

4,944,170

DEVICE FOR LIFTING A TIME BAN ON THE ACTUATION OF A MECHANISM IN A CONDITIONAL-OPENING LOCKING SYSTEM IN THE EVENT OF A BREAKDOWN

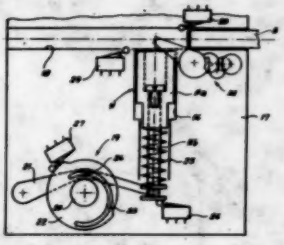
Francois Jolidon, La Chaux-de-Fonds, and Willy Richard, Les Convers 5, both of Switzerland, assignors to Reihor S.A., La Chaux-de-Fonds, Switzerland

Filed Aug. 19, 1987, Ser. No. 87,057

Claims priority, application France, Aug. 20, 1986, 86 11974

Int. Cl.[5] E05B *43/00*

U.S. Cl. 70—267 **8 Claims**



1. For use in a coded and conditional-opening locking system having a locking mechanism, a device for lifting, in the event of a breakdown in the locking system, a time ban on the actuation of said locking mechanism, said locking system comprising an electromagnetic latching unit for blocking the locking mechanism and electronic control means for activating and deactivating the electromagnetic latching unit according to a time-schedule thereby enabling or disabling actuation of the locking mechanism during preset times, wherein said device comprises detection means for sensing a breakdown in said locking system and transmission means controlled by the detection means for making, in response to the detection of a breakdown, said locking mechanism mechanically drive said electromagnetic latching unit such that actuation of said locking mechanism will render said electromagnetic latching unit inoperative regardless of its operative state at the time of detecting the breakdown.

4,944,171

TEMPORARY SUPPORT STRUCTURE, PARTICULARLY FOR EMERGENCY KEYS

Pierluigi Oliana, Via Redipuglia 13, 31015 Conegliano, Italy

Filed Feb. 2, 1989, Ser. No. 305,326

Claims priority, application Italy, Feb. 11, 1988, 82511 A/88

Int. Cl.[5] A47G *29/10*

U.S. Cl. 70—456 R **10 Claims**

1. Temporary support structure for emergency keys, comprising ahead rigidly associated with a stem perimetrally shaped so as to allow the actuation of a lock, and at least one planar base having at least one seat for said key and at least one means for a temporary engagement to adapted grip elements

provided at least on said head of said key, wherein said at least one planar base has a means for hooking to said head of said

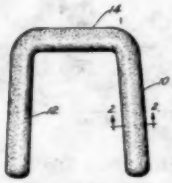
key constituted by a crosspiece, on said head of said key there is provided, transversely thereto, a head crosspiece seat shaped complimentarily to said crosspiece.

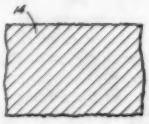
4,944,172

METHOD OF MAKING A U-SHAPED CLOSURE TAMPER EVIDENT

Alfred J. Evans, Raleigh, N.C., assignor to Delaware Capital Formation Inc., Apex, N.C.

Filed Nov. 14, 1988, Ser. No. 270,230
Int. Cl.[5] B24C *1/00*
U.S. Cl. 72—53 3 Claims





1. In the method for manufacture of an integral, U-shaped metal clip, the improvement comprising the steps of:

a. forming a length of wire by wire drawing techniques with a substantially uniform cross section and a minimum cross sectional area of approximately 0.005 square inches and a maximum cross sectional area of approximately 0.44 square inches;

b. initially texturing and work hardening the surface of the wire substantially uniformly to provide a roughness in the range of about 500 to 1000 micro-inches;

c. stress relieving the work hardened surface by further texturing the surface to a roughness in the range of about 100 to 500 micro-inches; and

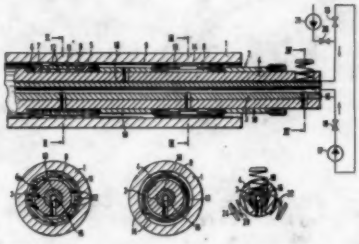
d. forming an integral length of the wire into a U-shaped metal clip, whereby the formed clip surface is tamper evident and the strength of the clip is enhanced relative to a clip formed without surface texturing.

4,944,173

PROBE FOR HYDRAULIC EXPANSION, INCLUDING CENTERING DEVICE

Helmut Swars, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,599
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729169
Int. Cl.[5] B21D *26/02*
U.S. Cl. 72—62 10 Claims



1. A flexible probe (2) for hydraulically expanding an inner faced tube (1) in portions, comprising:

seals (5) mounted and arranged in pairs on an outer surface of the probe, said pairs of seals defining operational regions therebetween when sealed against the inner face of the tube;

centering elements (11, 13) mounted on the probe and arranged between the seals of each said pair of seals, said centering elements flexibly resting against the outer surface of the probe (2) and flexibly contactable with the inner face of the tube when the probe is introduced into the tube, the centering elements being comprised of annular sleeves circumscribing the probe and having circumferentially distributed spring elements projecting therefrom and alternately bent inwardly toward the probe and outwardly toward a tube to be bent; and

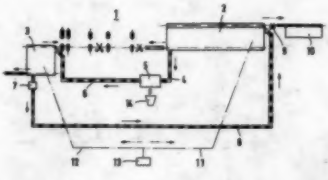
means for providing a pressurized hydraulic fluid to said operational regions so that the portions of the tube are expanded.

4,944,174

PROCESS FOR COOLING HEATED MATERIAL

Peter Muller, Neuss, Fed. Rep. of Germany, assignor to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 196,941
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1987, 3713401
Int. Cl.[5] B21B *45/02;* C21D *1/56*
U.S. Cl. 72—201 15 Claims



1. A process for heating metal stock prior to its introduction into a hot roll mill and subsequent cooling after its egression therefrom comprising the steps of:

situating a heating bath including molten metal at an entry into a hot roll mill such that metal stock entering the hot roll mill passes through the heating bath acquiring heat therefrom;

situating a cooling bath including molten metal at an exit from the hot roll mill such that the metal stock exiting the hot roll mill passes through the cooling bath delivering heat thereto;

flowing the molten metal in each of said baths counter to the direction of passing of the metal stock therethrough to form within each bath a hotter fraction and a cooler fraction of the molten metal; and

circulating the molten metal between the heating bath and cooling bath so that the hotter fraction of the molten metal in the cooling bath is transfered to the heating bath and the cooler fraction of the molten metal in the heating bath is transfered to the cooling bath.

4,944,175

UNIVERSAL ROLLING MILL STAND WITH ADJUSTABLE SETS OF HORIZONTAL ROLLS AND VERTICAL ROLLS

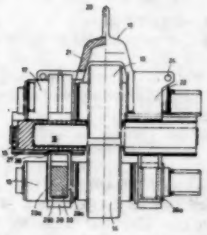
Alexandr Svngr, Hilden; Hans Bogendörfer, Düsseldorf; Klaus Riebschläger, Hilden; Hans-Jürgen Reismann, Düsseldorf, and Hubertus Wenig, Herne, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,384

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716501

Int. Cl.[5] B21B *31/08, 13/10*

U.S. Cl. 72—225 **16 Claims**



1. In a universal rolling mill stand with adjustable sets of horizontal rolls and vertical rolls guided in window-type recesses of roll housings, each roll housing having two roll housing halves formed by a pair of housing posts with cross-members connected by means of transverse supports, the rolls being provided with bearing chocks, the bearing chocks of the set of horizontal rolls being vertically movable between the housing posts of the respective pair of housing posts, the bearing chocks of the set of vertical rolls being movable horizontally between outwardly cantilevering attachments of the pair of housing posts, wherein the upper cross-members connecting the pairs of housing posts can be raised and swung horizontally, the improvement comprising a frame-type cage having plate-like members, the cage comprising means for connecting the cage comprising means for connecting the cage to lifting devices, means for guiding outer surfaces of the wall members of the cage on the guide surfaces of the housing posts of pairs of housing posts which face each other, the cage comprising means for vertically and horizontally moving the cage within the rolling mill stand and for installing the cage in and removing the cage from the rolling mill stand, inner surfaces of the wall members of the cage forming guide surfaces for adjustment movements of the bearing chocks of at least one of the rolls, the bearing chocks of at least one of the rolls being mounted to the cage and the bearing chocks of the other rolls being coupled to and suspended from the bearing chock of the at least one of the rolls mounted to the cage.

4,944,176

METAL PLATE BENDING MACHINE

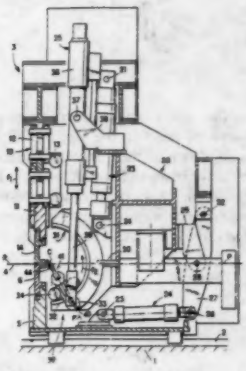
Jean-Marie A. Glorieux, Ecole Valentin, and Jean-Pierre M. D. Gouget, Besancon, both of France, assignors to Societe Anonyme DIMECO ALIPRESSE, Miserey Salines, France

Filed Apr. 18, 1989, Ser. No. 339,654

Claims priority, application France, Apr. 20, 1988, 88 05481

Int. Cl.[5] B21D *5/04*

U.S. Cl. 72—319 **9 Claims**



1. A metal plate bending machine comprising:

(a) a machine frame;

(b) clamping means to clamp a metal plate such that it extends in a feeding and transfer plane P;

(c) a pair of bending jaws located on either side of plane P, each bending jaws having a bending edge extending substantially parallel to plane P;

(d) a guiding and rolling track having a partial cylindrical configuration about a central axis C extending substantially parallel to plane P;

(e) a bending flap having a plane of symmetry P' and a bending surface for bending said metal plate extending substantially parallel to plane P;

(f) means movably attaching the bending flap to the guiding and rolling track so that the bending flap rides in said track such that the plane of symmetry p' extends generally radially from the central axis C and the angle between the plane of symmetry P' and plane P can be varied to bend said metal plate;

(g) a sub-frame chassis movably suspended from the frame and having the guiding and rolling track mounted thereon; and

(h) actuating means operatively interposed between the frame and the suspended sub-frame chassis to move the sub-frame chassis with respect to the frame so as to move the guiding and rolling track and, consequently the bending flap, with respect to the bending jaws.

4,944,177

AUTOMOBILE LOCK CAP CLINCHER

Robert C. Womack, 5119 Radbrook Pl., Dallas, Tex. 75220

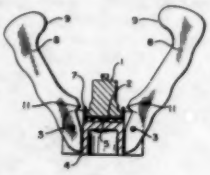
Filed May 22, 1989, Ser. No. 356,016

Int. Cl.[5] B25B *27/14*

U.S. Cl. 72—410 **7 Claims**

1. A cap clinching tool used for clinching metal caps in recaping automobile door and truck lock cylinders comprising: a tool base having an upper cylindrical pocket for receiving a cap, with sets of opposite side tabs, and a lock cylinder with a

head end about which tabs of the cap are clinched by the tool; two opposing handles each pivotally mounted by pivot mount means in said tool base on opposite sides of said upper cylindrical pocket; and each of said two opposing handles being formed with an inwardly directed clinching nose mounted above the pivot center of the handle about its pivot mount



means, and positioned to engage respective opposite side cap tabs aligned therewith bending the tabs initially inwardly and then progressively down as the clinching nose of each handle moves through an arc from a lateral movement to a semi-vertical movement pushing down on the cap tabs engaged by the inwardly directed clinching noses of the opposing handles as they are squeezed toward each other by a user's hand.

4,944,178

APPARATUS AND METHOD FOR MEASURING DISSOLVED GAS IN OIL

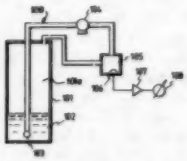
Yasuo Inoue; Masansri Kikkawa; Masaru Kamba, and Hiroshi Okuda, all of Kyoto, Japan, assignors to Nissin Electric Co., Ltd, Kyoto, Japan

Filed Apr. 5, 1989, Ser. No. 333,401

Claims priority, application Japan, Apr. 18, 1988, 63-95238; Sep. 27, 1988, 63-243709; Sep. 27, 1988, 63-126807[U]; Sep. 27, 1988, 63-126809[U]

Int. Cl.[5] G01N *7/00*

U.S. Cl. 73—19.1 **7 Claims**



1. A method of measuring a dissolved gas in oil comprising the steps of:

passing a bubbling gas into an oil sample having a dissolved gas in solution, taken out from oil handling equipment and contained in an extraction vessel, to form bubbles in said oil sample having a size within the range of from 0.1 to 8 mm;

stripping dissolved gas from said oil sample with said bubbles to form bubbles containing a gas mixture of said bubbling gas and dissolved gas stripped from said oil sample;

recovering the gas mixture in a gas recovering vessel and measuring the concentration of said dissolved gas with a gas sensor; and

returning said recovered gas mixture into said extraction vessel through a pump to thereby circulate said recovered gas mixture.

4,944,179

VIBRATION DETECTOR

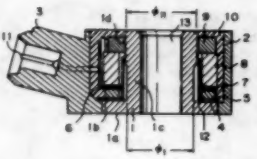
Satosi Komurasaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 252,407, Oct. 3, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 465,657

Claims priority, application Japan, Oct. 1, 1987, 62-150588[U]

Int. Cl.[5] G01P *15/09*

U.S. Cl. 73—35 **9 Claims**



1. A vibration detector for detecting the vibration of an object, comprising:

a bushing having a bolt hole extending therethrough, said bushing having a block portion for attaching said detector to said object by means of a bolt extending from said object through said bolt hole and a tube-like portion extending from said block portion, said tube-like portion having a threaded portion and a non-threaded portion, said non-threaded portion being between said threaded portion and said block portion, the outer diameter of said non-threaded portion being equal to or smaller than the minimum diameter of said threaded portion;

a piezoelectric element for converting vibration of said object into an electric signal;

a weight adapted to subject said piezoelectric element to a load; and

a nut engaged with said threaded portion of said tube-like portion, said piezoelectric element and said weight being secured by means of said nut.

4,944,180

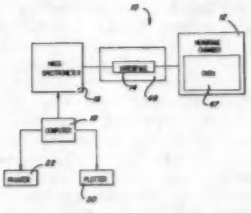
PERMEATION MEASUREMENT DEVICE

James C. Tou, and Donald C. Rulf, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 26, 1988, Ser. No. 237,290

Int. Cl.[5] G01N *15/08*

U.S. Cl. 73—38 **16 Claims**



1. A system for measuring the permeation rate of organic molecules across a polymer film, comprising:

chamber means for supporting a polymer film sample and permitting an upstream side of said polymer film sample to be swept with a fluid containing organic molecules and a downstream side of said polymer film sample to be swept with a carrier fluid under substantially atmospheric pressure and controlled environmental conditions on at least the upstream side of said polymer film sample;

interface means in communication with the downstream side

of said polymer film sample for enabling organic molecules which have permeated across said polymer film sample to be subjected to low pressure mass spectrometry analysis; and

mass spectrometer means for analyzing the concentration of said permeant organic molecules in said carrier gas.

4,944,181

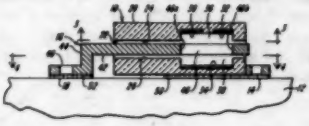
CAPACITIVE STRAIN GAGE HAVING FIXED CAPACITOR PLATES

Vincent P. Wnuk, Lunenburg, Mass., assignor to Hitec Products, Inc., Ayer, Mass.

Filed Aug. 30, 1988, Ser. No. 238,307

Int. Cl.[5] G01B 7/22

U.S. Cl. 73—780 **9 Claims**



1. A capacitive strain gage for measuring strain in a test specimen, comprising:

a housing attachable to the test specimen at a first location, said housing including a passage extending therethrough between spaced-apart opposing surfaces, one of said opposing surfaces having first and second electrodes disposed thereon and the other of said opposing surfaces having a third electrode disposed thereon, said electrodes each having fixed positions on said housing, and said first and second electrodes each being positioned for capacitive coupling to said third electrode; and

a ground plane attachable to the test specimen at a second location in movable relation to said housing, said ground plane including an arm that extends into the passage in said housing, said arm including an aperture for electric fields that is aligned with said electrodes in a quiescent position, said aperture being sized and shaped such that when strain in said test specimen causes relative movement of said housing and said arm, the capacitive coupling between said third electrode and at least one of said first and second electrodes is changed, wherein said first and second electrodes comprise parallel conductive strips perpendicular to the direction of relative movement of said housing and said ground plane, wherein said first and second electrodes have parallel outer edges perpendicular to the direction of relative movement and wherein the aperture in said ground plane includes parallel opposite edges that are respectively aligned with and parallel to the outer edges of said first and second electrodes.

4,944,182

AIR FLOW RATE METER AND METHOD FOR PRODUCING AN AIR FLOW RATE METER

Heinz Gseiss, Ludwigsburg; Wolfgang Kienzle, Hemmingen; Rudolf Sauer, Benningen, and Werner Wuensch, Unterriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

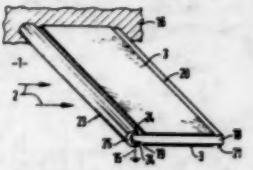
Filed Jan. 3, 1989, Ser. No. 292,868

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1988, 3801165; Nov. 12, 1988, 3838466

Int. Cl.[5] G01F 1/68

U.S. Cl. 73—204.26 **13 Claims**

1. An air flow rate meter for measuring the quantity of air aspirated by internal combustion engines, comprising at least one temperature-dependent measuring resistor disposed in a flow cross section on a substrate having an upstream and a downstream zone and embodied as a film, said upstream zone of the substrate (18) further including an end face (19) and a body (23) with a leading edge, said body (23) covers said end face (19) of the substrate and extends into a flow direction of the aspirated air flow, said substrate has upper and lower side



faces (20, 21) that are oriented parallel to the flow direction and said body (23) is U-shaped including legs that are secured to said side faces (20, 21) and which extend along said upstream zone of said substrate.

4,944,183

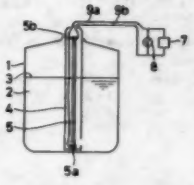
LEVEL GAUGE FOR LIQUID HELIUM

Tsuyoshi Masumoto; Akihisa Inoue; Kunio Matsuzaki, all of Sendai; Masami Ishii; Ryohei Yabuno, both of Toyota, and Tetsuo Oka, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Nov. 29, 1988, Ser. No. 277,379

Int. Cl.[5] C22C 28/00; J01F 23/24; H01B 12/00; G01K 7/00

U.S. Cl. 73—295 **8 Claims**



1. A level gauge comprising:

a sensing element comprising a superconductive alloy represented by the formula:

$$Mo_aRu_bZ_c$$

wherein

Z is phosphorous, boron, or a mixture of phosphorous and boron,

b has a value of about 32,

c has a value of about 20, and

a+b+c=100;

means for passing an electrical current through said sensir element; and

means for detecting an indicia of the electric current passing through said sensing element.

4,944,184

ASYMMETRIC FLEXURE FOR PENDULOUS ACCELEROMETER

Graeme A. Blake, Bellevue; Brian L. Norling, Mill Creek, and Mitchell J. Novack, Kirkland, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

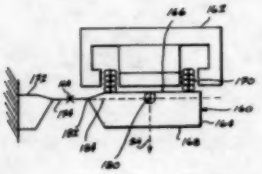
Filed Apr. 14, 1989, Ser. No. 338,808

Int. Cl.[5] G01P 15/13

U.S. Cl. 73—514 **7 Claims**

1. In an accelerometer for measuring acceleration along a sensing axis, the accelerometer comprising a proof mass suspended from a support by one or more flexures such that the proof mass can pivot with respect to the support about a hinge

axis, the proof mass comprising a paddle attached to the flexures, the paddle having first and second paddle surfaces and a coil mounted on the first paddle surface, the paddle surfaces being planar and parallel to one another, the accelerometer further comprising means for mounting the support and means for forming a magnetic circuit with the coil such that the proof mass can be maintained in a null position, the improvement



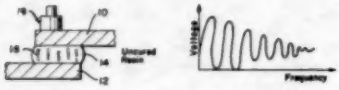
wherein the flexures are positioned such that a plane containing the hinge axis and a center of mass of the proof mass is parallel to one of the paddle surfaces, and closer to one paddle surface than to the other paddle surface, the second paddle surface not having a coil or other structure mounted thereon, such that the second paddle surface is accessible for use in a position pick-off system.

4,944,185

SYSTEM AND METHOD FOR QUALITATIVELY AND NONDESTRUCTIVELY INSPECTING ADHESIVE JOINTS AND OTHER MATERIALS

William G. Clark, Jr., Murrysville, and Warren R. Junker, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 17, 1989, Ser. No. 298,597
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—579 **33 Claims**



1. A method for nondestructively monitoring the structural integrity of a material wherein the material is impregnated with tagged particles, said system comprising the steps of:
activating said tagged particles to cause an inherent structural resonance in the material;
monitoring and measuring the activation and structural resonance of said material; and
relating the structural resonance of said material to the structural integrity of the material.

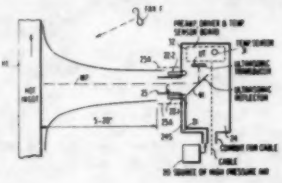
4,944,186

ULTRASONIC MEASURING SYSTEM

John A. Dorr, Crofton, Md., assignor to Xecutek Corporation, Annapolis, Md.

Filed Nov. 29, 1988, Ser. No. 277,604
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—597 **15 Claims**

1. In an ultrasonic range measurement system having an ultrasonic transducer for transmitting ultrasonic energy along a measuring path toward a hot target and for receiving reflection echoes of ultrasonic energy from said target, means for measuring the speed of sound in air in said measuring path and electronic means for determining the range to said target from the time of transmission of said ultransonic energy to the receipt of reflection of ultrasonic energy from said target, the improvement comprising, a source of measuring path air under pressure, means for forming a substantially homogenous column of said measuring path air between said ultrasonic transducer and said hot target a plenum chamber, means mounting said ultrasonic transducer within said plenum chamber on an



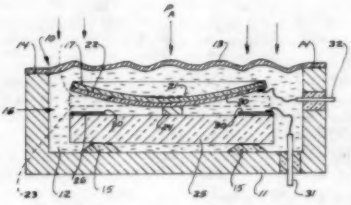
axis at a transverse angle to the axis of said measuring path, and an ultrasonic reflector for reflecting ultrasonic energy from said ultrasonic transducer through an opening in said plenum chamber to said hot target and from said target to said ultrasonic transducer through said opening.

4,944,187

MULTIMODULUS PRESSURE SENSOR

Roger L. Frick, Chanhassen, and Stanley E. Rud, Jr., Eden Prairie, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Dec. 23, 1988, Ser. No. 289,207
Int. Cl.[5] G01L *7/08, 9/04, 9/12*
U.S. Cl. 73—718 **25 Claims**



20. An apparatus for sensing a fluid pressure, comprising:
a first body disposed in the fluid having a first surface, the pressure tending to compress the first body at a first rate;
a second body disposed in the fluid having a second surface joined to the first surface, the pressure tending to compress the second body at a second rate different from the first rate;
the pressure compressing the joined bodies at different rates to cause the joined bodies to distort; and
means attached to the joined bodies for sensing the distortion and converting to an output indicating the pressure.

4,944,188

FASTENER TESTER

John H. Dial, 25 Ranger Rd., Cartersville, Ga. 30120

Filed May 10, 1989, Ser. No. 350,091
Int. Cl.[5] F16B *31/02*
U.S. Cl. 73—761 **22 Claims**

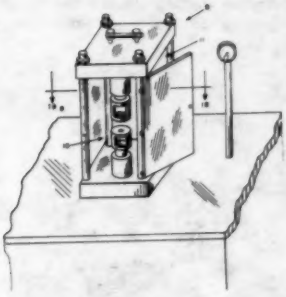
1. An apparatus for testing the performance of a fastener under load comprising:
an actuating assembly including:
a piston and cylinder assembly including a piston reciprocally mounted in a cylinder and having a piston rod extending from said cylinder;
a base member and a cap member disposed in spaced relation;
a plurality of support rods secured to said base member and

extending through said cap member, said support rods being secured to said base member and said cap member; and,

actuating means for actuating said piston for the reciprocal movement thereof.

a tensile loading structure including:

a plurality of compression rods, each said compression rod having lower and upper ends with a said lower end of each compression rod being secured to a said support rod of said actuating assembly and extending upwardly therefrom, a second cap member secured to said compression rods at said upper ends thereof;



a pair of shackles disposed for securing a fastener therein, a first of said pair of shackles secured to said piston rod for movement therewith, a second of said pair of shackles secured to said second cap member;

a recording member connected to said piston cylinder of said actuating assembly for recording the amount of tension being applied to said fastener through said shackles; and

an enclosure for enclosing said tensile loading structure.

4,944,189

ULTRASONIC SPECKLE VELOCITY MEASUREMENT METHOD AND APPARATUS

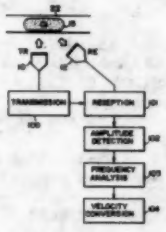
Masato Nakajima, and Takashi Ito, both of Tokyo, Japan, assignors to Aloka Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 275,728

Claims priority, application Japan, Nov. 30, 1987, 62-301736

Int. Cl.[5] G01F 1/66

U.S. Cl. 73—861.25 **9 Claims**



1. A non-Doppler ultrasonic speckle velocity measurement method comprising the steps of:

transmitting ultrasonic waves toward a moving measurement object including a large number of microscopic scattering bodies;

receiving echo signals generated by the interference of scattering waves reflected from said scattering bodies;

detecting the envelope of the time-based amplitude fluctuation of said echo signals;

frequency-analyzing said envelope of the time-based amplitude fluctuations to detect a fluctuation frequency showing the degree of said fluctuation; and

computing the speckle velocity from the fluctuation frequency.

4,944,190

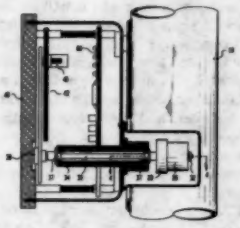
FLOW METER

Henry A. Scally, Lederach, and Harold L. Gingrich, Norristown, both of Pa., assignors to Ametek Corporation, New York, N.Y.

Filed Sep. 19, 1988, Ser. No. 246,099

Int. Cl.[5] G01F 1/22

U.S. Cl. 73—861.58 **4 Claims**



1. A flow meter comprising:

a flow tube adapted for connection into a fluid flow passage through which a fluid flow to be measured passes;

a magnetic float;

means for mounting said magnetic float within said flow tube for movement within said flow tube in response to said fluid flow;

a cylindrical magnet;

means for mounting said cylindrical magnet in proximity to said magnetic float and outside said flow tube for rotational displacement of said cylindrical magnet in response to changes in the magnetic coupling between said magnetic float and said cylindrical magnet caused by movement of said magnetic float within said flow tube;

a sensor responsive to rotational displacement of said cylindrical magnet for generating a voltage output signal having a sinusoidally varying amplitude dependent upon the angle of rotational displacement of said cylindrical magnet, said voltage output signal varying substantially linearly with said angle of rotational displacement of said cylindrical magnet over a limited range of rotational displacement of said cylindrical magnet;

a collar within which said sensor is mounted and having a rotation axis parallel to the axis of rotation of said cylindrical magnet;

and means for adjusting said collar for positioning said sensor in proximity to said cylindrical magnet and at a point on the circumference of said cylindrical magnet for producing said substantially linear voltage output signal for said limited range of rotation of said cylindrical magnet as said cylindrical magnet is rotationally displaced in response to movement of said magnetic float within said flow tube.

4,944,191

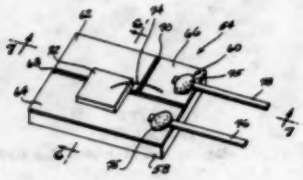
ULTRASONIC DETECTOR

John Pastrone, Los Gatos; George H. Fellingham, San Jose, and Michael Lawless, Boulder Creek, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 45,951, May 1, 1987, Pat. No. 4,821,558. This application Mar. 7, 1989, Ser. No. 307,489

Int. Cl.[5] G01N 29/00

U.S. Cl. 73—599 10 Claims



1. An ultrasonic liquid detector comprising:

an ultrasonic sound generator and an ultrasonic sound receiver spacedly separated apart from one another so as to receive a liquid carrying member therebetween;

each of said sound generator and sound receiver including a substrate and a layer of conductive material on said substrate, said conductive layer having at least two regions electrically isolated from each other, a piezoelectric chip placed in electrical contact over at least a portion of a first region of said conductive layer, and a conductive member extending between said piezoelectric chip and a second region of said conductive layer;

whereby when an electrical signal is applied between said first and second regions the piezoelectric chip on said sound generator is excited, causing ultrasonic sound to be generated, and whereby an amplitude of the ultrasonic sound received by said piezoelectric chip on said sound receiver is electrically detected by monitoring the electrical signal produced between the first and second regions of the conductive layer on said sound receiver, the amplitude of the ultrasonic sound received increasing substantially when liquid is present in the liquid carrying member between the sound generator and the sound receiver.

4,944,192

STARTER FOR AN INTERNAL COMBUSTION ENGINE

Akira Morishita, and Shuzoo Isozumi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 278,401, Dec. 1, 1988. This application Aug. 11, 1989, Ser. No. 392,504

Claims priority, application Japan, Dec. 26, 1987, 62-197808; Jan. 8, 1988, 63-1533; Feb. 26, 1988, 63-25276

Int. Cl.[5] F02N 11/02

U.S. Cl. 74—6 8 Claims

1. A starter for an internal combustion engine comprising:

an electric motor including an armature mounted on an armature shaft and accommodated in a cylindrical yoke and a commutator;

a washer abutting a rear end of said commutator;

a front frame coupled to an output side of said cylindrical yoke and having a central aperture;

an output shaft forming an integral front extension of said armature shaft of said electric motor to be driven and rotated;

a hollow cylindrical member coaxially disposed around and axially slidably splined to a portion of said output shaft;

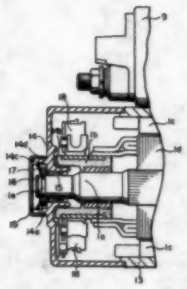
a hollow shaft coaxially and rotatably and axially slidably supported around a portion of said output shaft at a front side of said hollow cylindrical member splined to the output shaft;

a pinion gear formed at a front end of said hollow shaft and adapted to engage with a ring gear of the internal combustion engine;

a one-way clutch axially slidably disposed around said output shaft and coupling said hollow cylindrical member and said hollow shaft to transmit rotational motion in one rotational direction;

an annular bearing mounted to said central aperture of said front frame and rotatably and axially slidably supporting said hollow shaft extending therethrough;

a stopper member disposed on an axially slidable assembly including said hollow shaft and one-way clutch, said stopper member abutting against a rear side surface of said annular bearing to stop a forward movement of said axially slidable assembly at an extreme front position at which said pinion engages with a ring gear of the internal combustion engine; and



urging means for applying a thrust force urging the armature shaft of said electric motor in an axially forward direction, at least during a time when the electric motor is in rotation, thereby counterbalancing and cancelling an axially backward driving force acting on a splined portion of said output shaft from said axially slidable assembly at a time when said output shaft is in rotation to transmit a rotational force to said hollow cylindrical member, thereby to minimize friction between said washer and said commutator.

4,944,193

AUTOMATIC TRANSMISSION WITH A POWER TAKE-OFF MECHANISM

Koubei Harada, Nagoya City, and Hiromi Hasegawa, Obucity, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 28, 1989, Ser. No. 316,778

Claims priority, application Japan, Feb. 29, 1988, 63-026302[U]

Int. Cl.[5] F16H 37/00

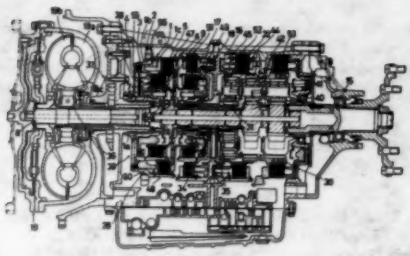
U.S. Cl. 74—15.86 8 Claims

1. An automatic transmission provided with a power take-off mechanism comprising:

a plurality of friction clutches and a plurality of planetary gears providing for multiple gear ratio changes of the transmission;

a front clutch drum connected with a transmission input shaft, said friction clutches being positioned coaxially and radially with respect to each other and being positioned radially interiorly of said drum; a step portion formed on a radial outer side of said drum and said drum receiving

radially interiorly therein a piston for operating one of said friction clutches positioned radially outwardly with



respect to another of said plurality of friction clutches; and

a power take-off gear fixedly connected to said step portion.

4,944,194

BACKUP CONTROL MEANS FOR SHIFT LEVER OF AN AUTOMATIC TRANSMISSION SYSTEMS

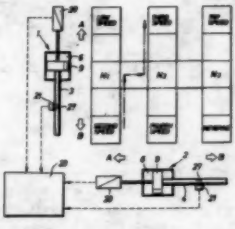
Akifumi Tanoue; Hiromi Kono, and Yuji Satoh, all of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 318,715

Claims priority, application Japan, Mar. 17, 1988, 63-61918

Int. Cl.[5] B60K *20/14*; G08B *21/00*

U.S. Cl. 74—335 **11 Claims**



1. A drive control apparatus of an automatic transmission system of an automotive vehicle for displacing a shift lever of the automatic transmission system in a shift direction and a select direction which are at right angles to each other, said drive control apparatus comprising:

(a) a shift actuator and a select actuator, each of said shift actuator and said select actuator comprising,

(i) a fluid pressure actuator,

(ii) a piston rod and a detection rod arranged to be displaced an equal amount with respect to each other in response to a working fluid being supplied to and discharged from said fluid pressure actuator, said piston rod operatively connectable to the shift lever,

(iii) a plurality of electromagnetic valve means for supplying and discharging said working fluid to and from said fluid pressure actuator according to a control signal, and,

(iv) a position switch means for withdrawably engaging in a detection grove formed in an outer periphery of said detection rod, and for outputting a reference position signal when engaged in said detection grove;

(b) first and second stroke sensor means for continuously detecting a displacement of said detection rod of said shift actuator and said select actuator, respectively, and for outputting corresponding first and second displacement detection signals, respectively; and,

(c) control means, coupled to said first and second stroke sensor means and said position switch means of each of said shift actuator and said select actuator, for calculating an optimal operating position of each of said shift actuator and said select actuator according to an operating state of the automotive vehicle, and for outputting said control signal to said electromagnetic valve means of each of said shift actuator and said select actuator according to the thus calculated optimal operating position of each of said shift actuator and said select actuator, and according to said first and second displacement detection signals respectively output by said first and second stroke sensor means when said first and second stroke sensor means are operable, and according to said reference position signal of said position switch of at least one of said shift actuator and said select actuator when a corresponding one of said first and second stroke sensor means is inoperable.

4,944,195

CONTROLLING TRANSMISSION

Takashi Takahashi, 26-18, Kamisoshigaya 1, Setagaya-ku, Tokyo, and Kinichi Endo, Hachioji, both of Japan, assignors to Takashi Takahashi, Tokyo, Japan

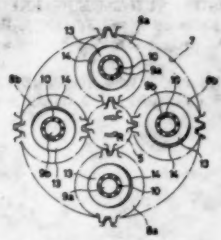
Continuation-in-part of Ser. No. 193,601, May 12, 1988, which is a division of Ser. No. 27,383, Mar. 18, 1987, Pat. No. 4,759,229. This application Sep. 22, 1988, Ser. No. 247,558

Claims priority, application Japan, Sep. 12, 1986, 61-215695; Oct. 21, 1987, 62-263665

The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.

Int. Cl.[5] F16H *55/18*

U.S. Cl. 74—409 **5 Claims**



1. A controlling transmission comprising

a planetary gear mechanism having at least one pair of intermediate gears interposed to mesh with a sun gear and an internal gear, each of said intermediate gears being rotatably supported by a shaft and means fixing each of said intermediate gear shafts in a position on a carrier with the teeth of one of said intermediate gears of each pair contacting only a first face of the teeth of said sun gear and of said internal gear, and the teeth of the other intermediate gear of each pair contacting only a second face of said teeth of said sun gear and of said internal gear, wherein each of said intermediate gears in each pair contacts said sun gear and said internal gear to transmit power in opposite directions of rotation when each of said intermediate gears in each pair is driven to rotate in a direction opposite to the direction of rotation of the other intermediate gear of that pair and teeth of each of said intermediate gears constantly contact said first and second faces of said sun gear and said internal gear.

4,944,196

CONJUGATE GEAR SYSTEM

Eugeny I. Rivin, Lathrup Village, Mich., assignor to The Board of Governors of Wayne State University, Detroit, Mich.

Filed Mar. 10, 1989, Ser. No. 321,375
Int. Cl.[5] F16H *55/16, 55/14*
U.S. Cl. 74—443 22 Claims

1. A gear system for transmitting mechanical power comprising a pair of meshingly engageable, conjugate toothed gears, the engagement therebetween producing a sliding component of motion and a rolling component of motion, at least one member of said pair of gears having at least one three-component tooth, which tooth includes:

a rigid core;

at least one rigid crescent disposed thereon, said crescent rollingly engageable with a tooth of the other member of the gear pair; and

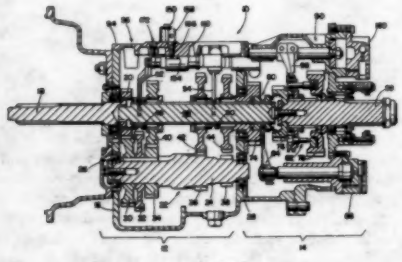
means for displaceably mounting the crescent on the core such that the crescent is displaceable with respect to the core in the direction of the sliding component of motion, whereby the sliding component of motion is separated from the rolling component of motion during meshing of the gear pair.

4,944,197

RESILIENT RANGE INTERLOCK

Alan C. Stine, Kalamazoo, and Joseph D. Reynolds, Climax, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1989, Ser. No. 362,786
Int. Cl.[5] F16H *63/36, 63/38, 59/08*
U.S. Cl. 74—477 9 Claims



1. A range type compound change gear transmission (10/210) comprising a multiple speed ratio main transmission section (12/212) connected in series with a multiple speed ratio range type auxiliary transmission section (14/214) and a shift control assembly (56/270) therefor, said control assembly comprising a shift bar housing assembly (56) including at least two parallel shift rods (96, 98) axially movable therein from axially nondisplaced to axially displaced positions to engage and disengage, one at a time, selected main transmission section ratios, means (148/270) to selectively axially move the shift rods, and means (150/298) effective only when said main transmission is in neutral for causing the shifting of said range type auxiliary transmission section, said transmission characterized by:

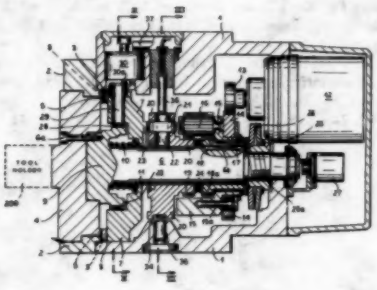
a range interlock assembly (178, 190) having a first position when one of said range auxiliary section speed ratios is engaged and a second position when said range auxiliary section is in a shift transient, said range interlock assembly in said second position resiliently inhibiting axial displacement of said main transmission section shift rods from the axially centered positions thereof.

4,944,198

TOOL-HOLDER TURRET WITH AN EPICYCLIC TRANSMISSION AND POSITIONING UNIT

Mario Natale, Cologno Monzese, and Pier C. Boffelli, Milan, both of Italy, assignors to Baruffaldi S.p.A., San Donato Milanese, Italy

Filed Jul. 1, 1988, Ser. No. 214,664
Claims priority, application Italy, Jul. 14, 1987, 21270 A/87; Jun. 8, 1988, 48062 A/88
Int. Cl.[5] B23Q *16/00*
U.S. Cl. 74—813 R 15 Claims



1. A tool holder turret for a lathe comprising:

a housing having a longitudinal axis and provided with a fixed support member coaxial with said housing;

a shaft extending longitudinally in said housing and having a respective axis parallel to said longitudinal axis, said shaft having a periphery thereof and formed with two opposite ends;

a rotary member mounted on one of said ends of said shaft and coaxial therewith;

a tool holder plate operatively connected with said rotary member and coaxial with said shaft;

a reversible drive motor spaced from said rotary member in said housing and having a motor shaft rotatable about a motor axis parallel to said longitudinal axis;

a differential epicyclic transmission unit comprising:

a first member driven by said driven motor and coaxial with said longitudinal axis;

a second annular member coaxial with said longitudinal shaft and connected rigidly with said shaft;

a third annular member spaced axially from said second member and rotatable about said longitudinal shaft, said first member meshing with said second and third members;

an axially movable member provided with means for engaging said support member and said rotary member in a preselected angular position of a respective tool of a plurality of tools to be located on said tool holder plate;

means for arresting the rotation of said shaft in said preselected angular position of the respective tool; and cam means for transmitting the rotational movement of said third member of said epicyclic transmission unit to said

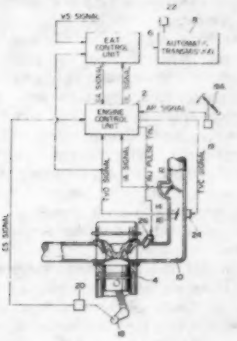
axially movable member for the axial displacement thereof.

4,944,199

CONTROL APPARATUS FOR A VEHICLE ENGINE EQUIPPED WITH AN AUTOMATIC TRANSMISSION

Yoshinori Okino; Naoyuki Noguchi; Tatsuya Kita, and Takuro Shigemura, all of Hiroshima, Japan, assignors to Mazda Motor Corp., Hiroshima, Japan

Filed Jul. 29, 1988, Ser. No. 225,790
Claims priority, application Japan, Jul. 31, 1987, 62-193118
Int. Cl.[5] B60K 41/02
U.S. Cl. 74—858 4 Claims



1. A control apparatus for a vehicle equipped with an automatic transmission having a lockup unit which is disposed between an output shaft of a vehicle engine and an input shaft of the automatic transmission and is activated at a speed larger than a lockup release speed at which said lockup unit is brought into a non-lockup position and which is set when the vehicle engine is decelerated, said control apparatus comprising:

means for detecting an operating engine speed of said vehicle engine;

means for calculating a deceleration rate of said operating vehicle engine;

means for setting said lockup release speed based on said deceleration rate in such a way that said lockup release speed becomes higher as said deceleration rate increases;

means for cutting off injection of fuel sprayed into a cylinder of said vehicle engine when said vehicle engine is decelerated;

means for resuming said injection of fuel when said operating engine speed reaches a fuel injection recovery speed which is set lower than said lockup release speed; and

means for increasingly correcting said lockup release speed according to said deceleration rate in such a way that the difference between said lockup release and fuel injection recovery speeds becomes larger as said deceleration rate increases.

4,944,200

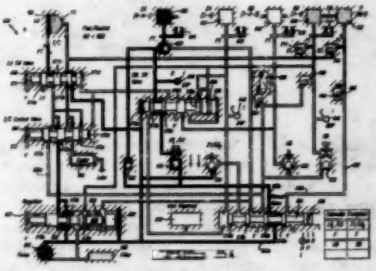
METHOD OF APPLYING REVERSE GEAR IN AN AUTOMATIC TRANSMISSION

Howard L. Benford, Bloomfield Hills; Maurice B. Leising, Clawson, and Gerald L. Holbrook, Rochester Hills, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 187,210
Int. Cl.[5] B60K 41/06
U.S. Cl. 74—867 7 Claims

1. In a vehicle transmission system including an input member, an output member, a torque converter assembly for transmitting torque between an engine and the input member, a gear assembly for changing the ratio of torque between the input member and output member, a plurality of frictional units for shifting the gear assembly, a fluid actuating device being movable for applying at least one frictional unit, at least one solenoid-actuated valve being movable in response to the presence or absence of electrical power to the valve for directing fluid flow between a fluid source and the fluid actuating device, at least one check valve, a manual valve moveable in response to a manual input, input sensors providing input signals of predetermined conditions, a controller for processing the input signals and providing output signals to control the at least one solenoid-actuated valve, a method of shifting the gear assembly in a vehicle transmission, said method comprising the steps of:

supplying fluid flow from a fluid source to through a manual valve in one predetermined position to a fluid actuating device to engage a frictional unit;



moving the manual valve in response to a manual input from one predetermined position to another predetermined position;

directing fluid to another fluid actuating device with fluid flow from the manual valve when in the latter position;

venting fluid flow from the former fluid actuating device past at least one check valve to disengage the former frictional unit for a time period;

applying the latter fluid actuating device to engage another frictional unit;

reading an input sensor to determined the time of application of the former fluid actuating device and adding an additional predetermined time period to that time to determine reapplication of the former fluid actuating device; and

reapplying the former fluid actuating device to engage the former frictional unit.

4,944,201

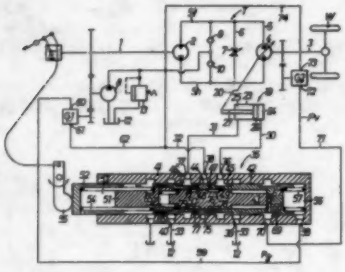
APPARATUS FOR CONTROLLING CONTINUOUSLY VARIABLE AUTOMOTIVE TRANSMISSION

Takashi Iino, and Yoshihiro Katagiri, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,756
Int. Cl.[5] B60K 41/14; F16D 31/02
U.S. Cl. 74—868 6 Claims

1. An apparatus for controlling a hydraulically operated continuously variable transmission in an automobile having an engine, the transmission including a transmission ratio controlling member and a hydraulic actuator operatively coupled to the transmission ratio controlling member for continuously operating the transmission ratio controlling member to increase or reduce the transmission ratio of the continuously variable automotive transmission, said apparatus comprising a control valve which applies a controlling hydraulic pressure to said hydraulic actuator dependent on the difference between a first control force commensurate with an indication of the

automobile driver's intention of acceleration or deceleration of the automobile and a second force commensurate with the rotational speed of the engine, in order to change the direction in which the hydraulic actuator is operated, said control valve comprising a cylinder having first and second ports communicating with said hydraulic actuator, a third port communicating with a source of hydraulic pressure, and a fourth port communicating with an oil tank, a first spool slidably disposed in said cylinder and slidable dependent on the difference be-



tween said first and second control forces for selectively bringing said third and first ports into mutual communication and said second and fourth ports into mutual communication or bringing said third and second ports into mutual communication and said first and fourth ports into mutual communication, a second spool slidably disposed in said first spool and movable in response to a control force commensurate with a control signal, and variable restriction means disposed between said first and second spools for varying the amount of controlling hydraulic pressure applied to said hydraulic actuator.

4,944,202

ELECTROHYDRAULIC CONTROL FOR AN AUTOMATICALLY SHIFTABLE AUTOMOTIVE TRANSMISSION

Georg Gierer, Kressbronn, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

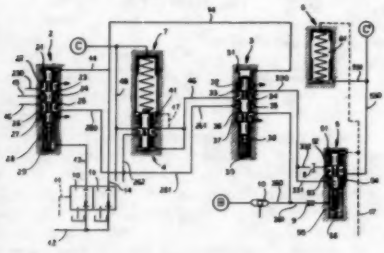
PCT No. PCT/EP87/00505, § 371 Date Feb. 24, 1989, § 102(e) Date Feb. 24, 1989, PCT Pub. No. WO88/02078, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 7, 1987, Ser. No. 328,581

Claims priority, application PCT Int'l Appl., Sep. 9, 1986, PCT/EP86/00517

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—869 **6 Claims**



1. An automatically shiftable transmission including a basic transmission comprising a gearing mechanism operated by a first clutch and by a second clutch, said first and second clutches being controlled by a fluid-operated control system, said system comprising:

electrohydraulic control means for supplying a control pressure in response to a shifting order;

a first gear-selection control valve receiving a pressure system and controlling the first clutch;

a first coupling valve hydraulically connected with said first control valve, said first coupling valve being formed with a space receiving a modulation pressure;

a first damping means cooperating with said first coupling valve for a gradual engagement of said first clutch;

a second gear-selection control valve hydraulically interlinked with said first control valve and with said first coupling valve for receiving said system pressure, said second control valve receiving said control pressure from said control means;

a second coupling valve hydraulically interlinked with said second gear-selection control valve for receiving said pressure system, said second coupling valve being formed with a front space receiving said modulation pressure and with a bottom space isolated from said front space, said second coupling valve having a first shifting position of said second coupling valve corresponding to synchronous operation of said clutches at a relatively high transmission load and a second shifting position of said second coupling valve corresponding to asynchronuous operation of said clutches at a relatively low transmission load of said transmission; and

a damper provided with a bottom chamber and a top chamber biased by spring means for regulating the engagement of the second clutch, said bottom chamber receiving said system pressure, said top chamber being interlinked with said front space of said second coupling valve and receiving said modulation pressure, said damper being blocked by said modulation pressure in said first shifting position of said second coupling valve at said second high transmission load defining the synchronous engagement of said first and second clutches, said damper being received at said low transmission load of said modulation pressure in said second shifting position of said second coupling valve registered by means for registering provided in said bottom space of said second coupling valve and defining the asynchronous engagement of said first and second couplings.

4,944,203

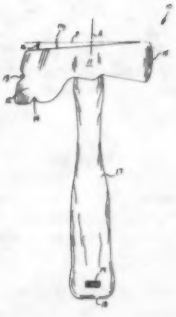
DRYWALL HAMMER AND MAGNETIC HANDLE

John A. Miller, Rt. #1, Box 1315, Quinton, Va. 23141

Filed Sep. 27, 1989, Ser. No. 413,222

Int. Cl.[5] B25D *1/04*

U.S. Cl. 81—24 **4 Claims**



1. A drywall hammer comprising an elongate metallic head member including a first beveled end terminating in an elon-

gate edge, and a second blunt end aligned with the first end, and

an elongate handle fixedly mounted to the head member symmetrically defined about a handle axis, the handle including a lowermost handle end defined by a first plane orthogonally aligned to the handle axis,

and

an elongate permanent magnet member extending through the handle adjacent the handle end orthogonally aligned relative to the handle axis,

and

wherein the handle includes an arcuate exterior surface, and each end of the elongate magnet extending through the handle is defined by an arcuate surface complementary to that defined by the handle,

and

wherein the head member is defined by a top planar surface, the top planar surface canted at an angle between five and fifteen degrees relative to a second plane, the second plane aligned orthogonally relative to the handle axis,

and

wherein the elongate edge of the beveled edge of the beveled end of the head member includes a first notch, and a second notch directed interiorly of a bottom surface of the head member adjacent the elongate edge oriented orthogonally relative to the first notch,

and

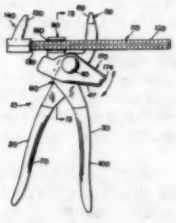
wherein the magnet member includes a first and second magnet, the first magnet includes a first cylindrical head member, and the second magnet includes a second cylindrical head member, the first head member is orthogonally mounted to and coaxially aligned with a first shank of a first diameter, and a threaded shank of a reduced second diameter coaxially aligned with the first shank integrally formed to the first shank of the first magnet, and the second head member including a second shank of a first diameter and formed with an integrally threaded bore to receive the threaded shank of the first magnet, and a bore defined by the first diameter directed orthogonally relative to the axis of the handle through the handle and adjacent the handle end.

4,944,204

PLIERS WITH ADJUSTABLE JAW MEANS

Roland J. West, 303 Ridgewood Dr., Mystic, Conn. 06355

Filed Dec. 2, 1988, Ser. No. 278,783
Int. Cl.[5] B25B 7/04
U.S. Cl. 81—385 **15 Claims**



1. Adjustable jaw pliers comprising

a pair of pliers having a first pliers handle and a second pliers handle, said first pliers handle and said second pliers handle crossing with respect to each other, traversing one within the other and being connected together with respect to one another by a pivot pin,

said first pliers handle forming a first pliers jaw above the crossing region of said first pliers handle and said second pliers handle, said first pliers handle forming a first grip portion below said crossing region,

said second pliers handle forming a quick release threaded rod positioning means above said crossing region and said second pliers handle forming a second grip portion below said crossing region, said first pliers jaw having a first work engaging surface,

a threaded rod having male threads and an end coupled to a second pliers jaw and being coupled to said quick release threaded rod positioning means,

said second pliers jaw having a second work engaging surface being disposed in opposed cooperating relationship and essentially parallel to said first work engaging surface of said first pliers jaw,

said thread rod being essentially perpendicular to said first work engaging surface of said first pliers jaw and said second work engaging surface of said second pliers jaw,

said quick release threaded rod positioning means having partial internal female threads for engaging a portion of said male threads of said threaded rod, said quick release threaded rod positioning means engages and disengages said threaded rod to reposition said threaded rod to change the distance between said first work engaging surface of said first pliers jaw and said second work engaging surface of said second pliers jaw,

said first pliers jaw includes a clearance space for said threaded rod to extend from said quick release threaded rod positioning means past said first pliers jaw, and

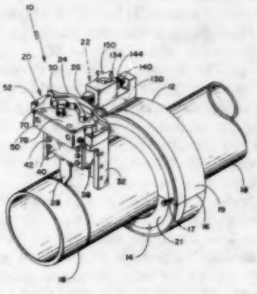
said pair of pliers having a locking means for locking said threaded rod into said quick release threaded rod positioning means, said locking means being connected to said pivot pin of said pair of pliers, said locking means pivoting on said pivot pin to engage said quick release threaded rod positioning means.

4,944,205

RATCHET FEED DRIVE FOR CLAMSHELL LATHE

Donato L. Ricci, Rte. 1, Box 1067, Hager City, Wis. 54014

Filed Jan. 29, 1990, Ser. No. 471,775
Int. Cl.[5] B23B 3/22
U.S. Cl. 82—113 **6 Claims**



1. A ratchet tool feed drive for a clamshell lathe, said clamshell lathe being of the type comprising a toroidal structure including a stationary member for clamping a cylindrical workpiece therein and a motor driven relatively movable member encircling said workpiece and rotatable about the longitudinal axis of said cylindrical workpiece, said ratchet tool feed drive comprising in combination:

(a) guide block means attachable to said relatively movable member for rotation therewith, said guide block means including a guideway oriented radially relative to said workpiece when said guide block means is attached to said relatively movable member;

(b) tool holding means disposed in said guideway of said guide block for reciprocal sliding movement therein, said tool holding means including a bore extending parallel to

said guideway when said tool holding means is disposed within said guideway;

(c) lead screw means having a threaded nut thereon and extending through said bore, said nut being in engagement with said tool holding means whereby rotation of said lead screw means imparts translational motion to said tool holding means in said guideway;

(d) driven gear means attached to said lead screw;

(e) cam actuated ratchet gear means selectively operatively coupled to said driven gear means; and

(f) means attached to said stationary member for engaging said cam actuated ratchet gear means on each revolution of said movable member.

4,944,206

PROCESS AND INSTALLATION FOR PREPARING METAL BILLETS TO BE EXTRUDED

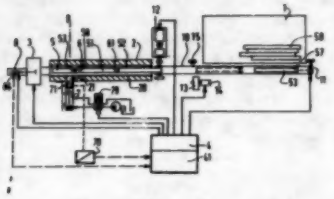
Bessey Guy, Auvers Sur Oise, and Jean-Yves Bouchut, Sorbiers, both of France, assignors to Clecim, Cedex, France

Filed Oct. 5, 1988, Ser. No. 253,645

Claims priority, application France, Oct. 5, 1987, 87 13740

Int. Cl.[5] B23D *33/02*

U.S. Cl. 83—42 **13 Claims**



1. A process for preparing from elongate bars (5) metal billets (B) having a length (b) and adapted to be extruded in an extrusion press, said process being carried out in apparatus comprising

a storage magazine table (1);

a tubular heating furnace (2) having an entrance and an exit,

hot shears (3) defining a shearing plane (Q) located downstream of said exit of said furnace (2);

a conveyor (10) for advancing said bars in succession along a generally straight path through said heating furnace (2) and said shears (3), said conveyor being associated with means for continuously measuring a length of advance of said bars and comprising means for stopping said advance when a length (b) of a said bar (5) to be cut has advanced downstream of said shearing plane (Q);

a loading device for receiving each billet from said shears and for placing it in the axis of said extrusion press,

said process comprising the steps of:

(a) determining the position of a stationary locating plane (P) intersecting the path of said bars at a point placed at a distance (Y) upstream of said shearing plane (Q) at least equal to the length (b) of a billet;

(b) advancing said bars (5, 51) one behind the other, the bars (5) to be cut being in contact with a succeeding bar (51) along a parting plane (6);

(c) continuously monitoring, during the advance of said bars (5, 51), the possible passage of said parting plane (6) through said stationary locating plane (P);

(d) in the event that such a passage is detected, continuously measuring the length of advance (X) of said bar (5) from the moment of passaging up to the moment of stopping the advance of said bars for cutting said bar (5);

(e) calculating the remaining length ($a=Y-X$) of the bar (5) after cutting by subtracting said length advance (X) from the distance (Y) between said locating plane (P) and said shearing plane (Q);

(f) deducing the expected length of said remnant ($c=a-nb$) after the cutting of a whole number (n) of billets of normal length (b) by subtracting from said remaining length (a) the accumulated lengths ($n\times b$) of the billets which can still be sheared in said bar (5) from the detection moment;

(g) comparing the absolute value of said expected length (c) with a critical length (l) corresponding to the handling limit of said remnant; and

(h) determining the shearing conditions in order to prevent an oddment of a length below said critical length (l) from being produced on either side of said parting plane (6).

4,944,207

SINGLE SHEAR BLADE MECHANISM FOR GOB SEVERING

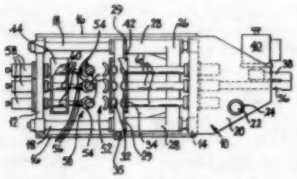
Hermann H. Nebelung, Winsen/Luhe, and Walter Ruschau, Monheim, both of Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Towson, Md.

Filed Oct. 13, 1989, Ser. No. 421,416

Claims priority, application United Kingdom, Oct. 18, 1988, 8824401

Int. Cl.[5] C03B *7/12*

U.S. Cl. 83—162 **2 Claims**



1. A mechanism for shearing discrete gobs from a runner of molten glass, comprising:

a shear blade having cutting edges on opposite sides thereof,

means for displacing said shear blade form a first rest position through the runner to shear the runner with the cutting edge on one side of said shear blade and for displacing said shear blade from a second rest position through the runner to shear the runner with the other cutting edge,

opposed gob guide means,

means for displacing one of said gob guide mans from a retracted position toward said first rest position to a selected gob guide location before said shear blade is displaced from said first rest position to shear a gob,

means for displacing the other one of said gob, guide means from a retracted position toward said second rest position to a selected gob guide location before said shear blade is displaced from said second rest position to shear a gob,

shroud means for enclosing said shear blade when said shear blade is located at either said first or second rest positions, and

means from introducing a mist of coolant into said shroud means to cool said shear blade, the mist condensing on the cooler shroud means to keep the shear blade free of coolant.

4,944,208

GUITAR WITH ADJUSTABLE TREMOLO

Peter A. Kusek, 1705 Westchester, Denton, Tex. 76201

Filed Apr. 21, 1989, Ser. No. 341,541

Int. Cl.[5] G10D *3/12*

U.S. Cl. 84—313 **4 Claims**

1. A guitar, comprising:

a body:

a neck, extending from the body;

a nut on the distal end of the neck;

a plurality of strings, attached to the distal end of the neck and stretched over the nut;

a plurality of tremolo bases, each tremolo base being attached to one of the strings and mounted on the body of the guitar to pivot about an axis perpendicular to the strings;

a plurality of tremolo keys, each tremolo key being attached to one of the tremolo bases for pivoting the tremolo base to modulate the pitch of the associated string;

a plurality of tremolo blocks, each tremolo block extending from one of the tremolo bases into a cavity in the body of the guitar;

a plurality of springs, each spring being attached between

one of the tremolo blocks and the body of the guitar for returning the tremolo base to a neutral position when the associated tremolo key is released;

an actuator rod, mounted for movement between a first position, in which the actuator rod allows the tremolo keys to operate independently, and a second position, in which the actuator rod locks the tremolo bases together;

an activation lever mounted for movement between a first position and a second position; and

a cam mounted on the activation lever in contact with the actuator rod to move the actuator rod between the first and second positions of the actuator rod as the activation lever is moved between the first and second positions of the activation lever.

4,944,209

STRINGED INSTRUMENT PIEZOELECTRIC TRANSDUCER

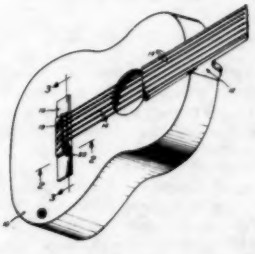
Lawrence R. Fishman, 76 Grove St., W. Medford, Mass. 02155

Continuation-in-part of Ser. No. 876,238, Jun. 19, 1986, Pat. No. 4,774,867, which is a continuation-in-part of Ser. No. 856,189, Apr. 28, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 251,570

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[5] G10H *3/18*

U.S. Cl. 84—731 **21 Claims**



16. A stringed instrument transducer system that is adapted to be positioned adjacent the instrument strings to receive acoustic vibratory signals therefrom and comprising a first electrically conductive member, a second electrically conductive member, a plurality of piezoelectric crystals disposed between the first and second conductive members so as to provide an elongated unitary structure and with the crystals disposed so as to be in alignment with respective strings when installed in the musical instrument, a conductive shield means for shielding said transducers disposed about said unitary structure, said conductive shield means comprising a base dielectric layer adapted to be wrapped about the unitary structure and having vapor deposited thereon a metallic layer, and electrical lead means for conducting an electrical signal, said electrical lead means connecting to the first and second electrically conductive members, respectively.

4,944,210

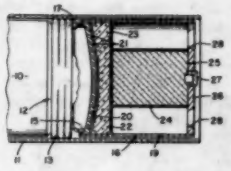
MISSILE LAUNCHER

Thomas G. Flock, Thousand Oaks, and Scott D. Baysinger, Chatsworth, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 8, 1988, Ser. No. 229,882

Int. Cl.[5] F41F *3/04*

U.S. Cl. 89—1.818 **11 Claims**



1. Apparatus for launching a missile, comprising:

an open-ended tube for receiving the missile therewithin, said tube being longer than the missile and having fore and aft ends;

a selectively actuatable pressurized gas generator having external dimensions enabling sliding receipt of the generator within the tube aft end, said generator having a diffusor through which gas can move along in a first direction and a plurality of openings through which gas can move in a second direction generally opposite to the first direction; and

an expandable, air-tight, bag-like member, said bag-like member having an opening for receiving gas passing through the diffusor,

whereby expansion of said bag-like member causes said missile to be launched from said tube.

4,944,211

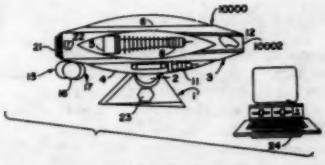
MASS ACTION DRIVER DEVICE

Larry Rowan, 3440½ Caroline Ave., and Larry Rosenberg, 3440 Caroline Ave., both of, Culver City, Calif. 90230

Continuation-in-part of Ser. No. 590,283, Mar. 19, 1984, abandoned. This application Dec. 30, 1986, Ser. No. 947,746

Int. Cl.[5] F41F *1/00, 1/02*

U.S. Cl. 89—8 **11 Claims**



1. A multi-stage, mass-action driver device, including:

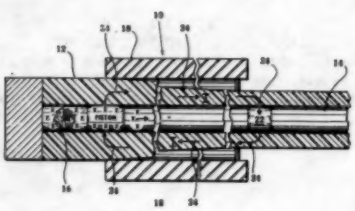
computerized driver-control means having output terminals providing driver-sequencing signals;
a loading chamber for receiving and automatically advancing plasmatizable wafers;
plasmatizable wafers carried by said loading chamber;
a firing chamber electrically coupled to said output terminals and mechanically communicating with said loading chamber for receiving and plasmatizing, in a pre-determined sequence, said plasmatizable wafers, said firing chamber being responsive to the receipt of each of said wafers to self-seal while each wafer is being plasmatized;
said firing chamber including an electric arc coupled to a source of electrical power and to said output terminal and responsive to the sealing of said firing chamber to convert each of said wafers to a plasma state to form plasmoids;
a composite bore communicating with said firing chamber for receiving said plasmoids;
said composite bore including a series of aligned centrally located openings therethrough and multiple, longitudinally aligned and spaced, electrically conductive rails, concentrically positioned with respect to said bore;
means coupled to said output terminals for applying predetermined potentials from said external source, in sequence, to said rails;
plasma-accelerator means interposed between said firing chamber and said bore for accelerating plasmoids from said firing chamber towards said bore;
electromagnetic means circling said bore and positioned after said plasma-accelerator means in the direction of said bore, which means direct and accelerate plasmoids from said firing chamber;
means coupled electrically to said output terminals and located following said plasma-accelerator means in the direction of said bore for automatically injecting projectiles into said bore for propulsion by said plasmoids; and,
means for applying operating potentials to said driver device under the control of said computerized driver-control means;
said plasma-accelerator means including a plurality of radially disposed Tesla coils having their discharge ends positioned in a common cavity which is coupled to and follows said firing chamber in the direction of said bore.

4,944,212

MAGNETIC ADVANCED HYBRID RAIL GUN

Mohamed A. Hilal, Madison, Wis., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Apr. 6, 1989, Ser. No. 334,308
Int. Cl.[5] F41F *1/02*
U.S. Cl. 89—8 **8 Claims**



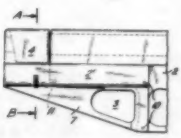
1. An advanced concept rail gun comprising;
a non-conductive and non-magnetic rail gun barrel having a bore and an upstream and downstream end;
said barrel having a field winding wrapped around the outside thereof intermediate the ends thereof;
a low power source for charging said field winding;
a chemical reaction chamber in the upstream end of said barrel;
a pair of juxtaposed electrical conducting normally non-powered rails within said barrel extending from said chemical reaction chamber to the downstream thereof;
a piston guided within said bore during downstream movement by said rails normal to a field created by said field winding;
a projectile positioned in said bore downstream of said piston and guided by said rails whereby when said chemical reaction occurs in said reaction chamber said piston and said projectile are caused to translate within the bore at high speed in a downstream direction which causes emf from said field windings to be induced in said rails which further increases the velocity of said projectile as it exits the bore.

4,944,213

COMPENSATOR FOR HAND-HELD FIREARMS

Charles Ewert, Luxembourg, Luxembourg, assignor to Unipatent Holding S.A.

Filed Oct. 18, 1988, Ser. No. 259,159
Claims priority, application Austria, Oct. 19, 1987, 2762/87
Int. Cl.[5] F41A *21/36*
U.S. Cl. 89—14.3 **11 Claims**



1. A compensator arrangement for redirecting propellant gases leaving the barrel muzzle of a hand-held firearm having a grip and a barrel, comprising:
a compensator attached to the grip so as not to interfere with disassembly and servicing of the firearm, and so as to be in front of the barrel;
an extended grip portion provided so as to extend under and toward the front of the barrel, the compensator being attached to the extended grip portion; and
latch means for locking the compensator on the extended grip portion.

4,944,214

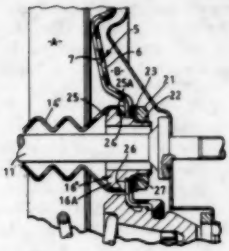
BRAKE SERVO BOOSTER

Stuart J. Briggs, Gwent, Great Britain, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 31, 1988, Ser. No. 264,985
Claims priority, application United Kingdom, Nov. 14, 1987, 8726722
Int. Cl.[5] F01B *19/00*
U.S. Cl. 92—98 R **17 Claims**

1. A brake servo booster comprising:
a housing;
a movable partition in said housing dividing said housing into a pair of chambers, said partition including a diaphragm secured in sealing relationship to said housing and being operatively connected to a force output member for the transmission of a power assistance force to a brake master cylinder;
at least one support member extending through said partition for connecting the booster, in use, to a fixed support, said at least one support member having an external surface;
a protective boot extending longitudinally of said at least one support member and surrounding said external surface thereof;
end regions on said boot, one of said end regions being connected to said at least one support member; and

a carrier member extending through said partition and engaged by adjacent portions of said boot and diaphragm for



connecting the other end of said protective boot to said partition.

4,944,215

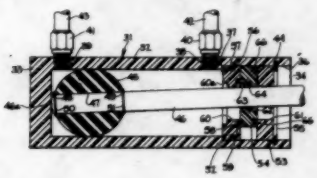
FLUID ACTUATED CYLINDER ASSEMBLY WITH A FLOATING CYLINDER HEAD

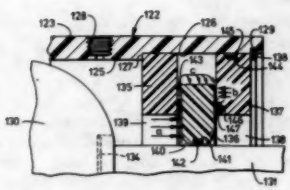
Frank D. Nimmo, 3851 Bennett, Cincinnati, Clermont Cty., Ohio 45245, and William H. Newton, 8009 Blairhouse Dr., Cincinnati, Hamilton Cty., Ohio 45244

Continuation-in-part of Ser. No. 283,979, Dec. 13, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 307,019

Int. Cl.[5] F16J *15/18*

U.S. Cl. 92—168 **35 Claims**





1. A fluid actuated cylinder comprising a cylinder body, a piston, a piston rod and a cylinder head, said cylinder body having an axial bore with an open forward end and a closed rearward end, said piston rod having a rearward end, said piston being mounted on said piston rod at said rearward end thereof, said piston and piston rod being slidably mounted within said cylinder bore, means on said piston making a continuous seal with said cylinder bore, said piston rod extending through a central bore in said cylinder head and being slidable with respect thereto, means mounting said cylinder head near said cylinder body forward end, said cylinder head being so sized and said mounting means therefor being such that said cylinder head is shiftable in at least two opposite directions within a plane perpendicular to the longitudinal axis of said cylinder body, whereby wear of the cylinder assembly parts due to misalignment of the longitudinal axis of said piston rod with respect to the longitudinal axis of said cylinder body is greatly reduced.

4,944,216

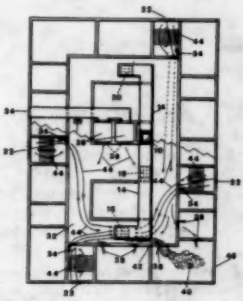
BUILDING EMERGENCY EXHAUST FAN SYSTEM

Wilmot R. McCutchen, 9 Sally Ann Rd., Orinda, Calif. 94563

Filed Nov. 13, 1989, Ser. No. 435,749

Int. Cl.[5] F24F *11/00*

U.S. Cl. 98—33.1 **17 Claims**



1. A process, reserved for emergency purposes only, for safely evacuating smoke and gaseous emissions caused by a fire from anywhere within the occupied area of a building and simultaneously drawing fresh air into said building to replace the withdrawn smoke and gas, said building comprising a roof and enclosing outer perimeter walls, and one or more stories, each story comprising a floor and a ceiling, at least one entrance, at least one emergency exit leading directly to the outdoors, and an interior space subdivided into a plurality of zones, comprising the steps of:

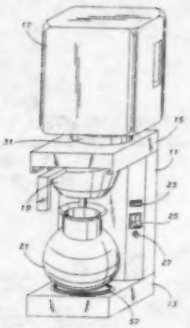
(a) detecting and identifying, by smoke detection means, the presence of a smoke and gas source, and the location of a story and a zone within said story containing said smoke and gas source; and

(b) actuating, by remote control means, one or more emergency exhaust fans near the roof of said building to create significantly lower than atmospheric pressures within a main vertical exhaust duct connected to the inlet of said emergency exhaust fans; and

(c) opening, by remotely controlled damper means, a single exhaust air intake connected to said main vertical exhaust duct by means of a feeder duct, said exhaust air intake being located within the zone containing said smoke and gas source and away from any of said entrances and said emergency exits, to create a draft and directed stream of air with a velocity sufficient to carry said smoke and gaseous emissions from the occupied area of said building and to overcome the natural ventilation currents caused by said fire and to withdraw said smoke and gaseous emissions through said main vertical exhaust duct and said exhaust fan to a safe discharge location outside of said building; and

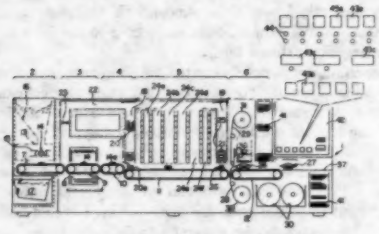
(d) opening said entrance and said emergency exit to said story to admit a flow of fresh and uncontaminated air toward the partial vacuum created at said smoke and gaseous emissions source.

4,944,217
AUTOMATIC COFFEE BREWING APPARATUS
Sharky Watanabe, 31 Deer Creek, Irvine, Calif. 92714
Filed Jul. 13, 1989, Ser. No. 379,475
Int. Cl.[5] A47J 31/34
U.S. Cl. 99—280 7 Claims



1. An automatic coffee brewing apparatus having an input port for receiving a disposable water bottle, the water bottle storing a sufficient volume of water to brew a plurality of decanters of coffee, comprising:
(a) a housing formed to receive the water bottle;
(b) a first valve in fluid communication with the input port for controlling the flow of water from the water bottle;
(c) a reservoir in fluid communication with said first valve for receiving and storing at room temperature a measured quantity of water from the water bottle;
(d) a sensor for sensing the water level within said reservoir and for generating signals in response thereto;
(e) a heater in fluid communication with said reservoir for heating the measured quantity of water; and
(f) a controller for controlling the operation of said first valve and said heater in response to said sensor signals.

4,944,218
VENDING MACHINE FOR PREPARING AND DELIVERING HAMBURGERS
Christian Cresson, 6, rue Marie-Thérèse de Poix, Sepmes F-37800 Sainte Maure de Touraine, France
Filed Apr. 6, 1989, Ser. No. 334,282
Claims priority, application France, Apr. 12, 1988, 88 04820
Int. Cl.[5] A21D 13/08; A23L 1/31; B65B 25/16; G07F 11/70
U.S. Cl. 99—357 11 Claims



1. A vending machine for preparing and delivering hamburgers, wherein automatic operation of said machine can be initiated by a consumer by means of a payment system and wherein said machine comprises in the direction of feed of one or a plurality of conveyors terminating at a station for the delivery of each hamburger:
a cooking oven through which the conveyor passes and which is capable of cooling each piece of meat supplied from a supply of pieces of meat,
a first station for delivering a first series of half-rolls of bread on the conveyor in order that each half-roll may serve as an element for receiving a piece of meat supplied from the cooking oven,
a second station for delivering a second series of half-rolls of bread in order that each half-roll may serve as a covering element on a piece of meat already carried by a first half-roll of the first series,
a statica for wrapping each hamburger thus formed, the function of this station being to wrap said hamburger between two films of wrapping material, within a pouch which is open on one side, the conveyor being divided into two successive sections upstream of the first station for delivering each half-roll of the first series, the upstream section of said conveyor being located at a higher level than the downstream section so as to deliver a piece of meat on the top face of a first half-roll which has already been placed on the downstream section of the conveyor.

4,944,219
TORSION LEVERAGE NUTCRACKER
John W. Hambright, 1212 Chaparral, DeSoto, Tex. 75115, and Jerry S. Hambright, Rte. 1, Box 344, Hawkins, Tex. 75765
Filed Dec. 12, 1988, Ser. No. 282,592
Int. Cl.[5] A23N 5/00; A47J 43/26
U.S. Cl. 99—581 17 Claims

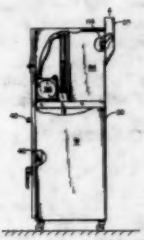
1. A nutcracker comprising:
upper and lower endplates, each said endplate comprising a plate member having a central portion;
said upper endplate plate member having an aperture-free central portion and a plurality of widely spaced apertures;
said lower endplate plate member having a plurality of apertures closely spaced in said central portion thereof;
a plurality of elongated rod members loosely interfitted at said ends thereof with said apertures in said upper and lower endplates to define a tapered nut enveiope, said nut envelope being compressible by relative rotation of said upper and lower endplates; and
adjacent ones of said rod members being spaced apart to receive nuts into said nut envelope at said ends thereof interfitted to said upper endplate, with said rod members being closely spaced at said ends thereof interfitted to said lower endplate, such that a nut admitted into said nut envelope between two adjacent ones of said rod members, drops by gravity into contact engagement with said rod members at a lower position, and cracking forces are applied to said nut by relatively rotating said upper and lower endplates.

4,944,220

TRASH COMPACTOR FOR SANITARY HANDLING OF SOLID WASTE

Anthony Fox, Bloomington, Minn., assignor to TFC Corporation, Bloomington, Minn.

Filed May 26, 1989, Ser. No. 357,206
Int. Cl.[5] B30B *9/00, 15/06*
U.S. Cl. 100—90 **10 Claims**



1. The trash compactor of the type comprising a cabinet having a top, a floor, three mutually perpendicular side walls forming a hollow, rectangular, parallelepiped with an open front, said cabinet being divided into a machine compartment, a trash receiving compartment and a compaction compartment, said machine compartment including a compaction plate mounted for vertical reciprocal movement through said trash receiving compartment and into said compaction compartment and drive means coupled in driving relation to said compaction plate; and door means hinged to one of said side walls for moving in open and closed relation relative to said open front, the improvement comprising:

(a) an air plenum mounted in said machine compartment, said plenum having an air inlet in fluid communication with said trash receiving compartment and said compaction compartment and an air discharge port with filter means disposed in said air plenum between said air inlet and said air discharge port;

(b) motor driven fan means mounted in said air plenum for exhausting air out of said air discharge port;

(c) air flow sensing means disposed proximate said discharge port; and

(d) indicator means operatively coupled to said air flow sensing means for signaling when the rate of flow of air through said discharge port drops below a preset level indicative of the need for filter replacement.

4,944,221

ARTICULATED LEVER CUTTING AND FORMING PRESS

Werner Leinhaas, Geinhausen, Fed. Rep. of Germany, assignor to E. Bruderer Maschinenfabrik AG, Switzerland

Continuation of Ser. No. 163,822, Feb. 22, 1988, Pat. No. 4,850,272. This application May 8, 1989, Ser. No. 348,855
Claims priority, application European Pat. Off., Jun. 20, 1986, 86108482.0
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] B30B *1/10*
U.S. Cl. 100—286 **17 Claims**

1. An articulated-lever cutting and forming press, comprising:

(a) a press stand;

(b) a frame-shaped press slide slidably arranged within said press stand;

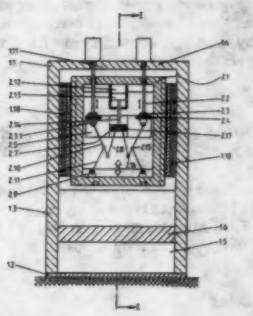
(c) two symmetrically identical articulated lever systems located within said press slide, said articulated lever systems including joints, said articulated lever systems folding with their joints toward the center of said press slide;

(d) a hydraulic cylinder drive for actuating said articulated lever systems;

(e) a multi-articulated support guided in the center of said press, said multi-articulated support being connected to said hydraulic cylinder drive; and

(f) two connecting rod means movably arranged on said multi-articulated support, said connecting rod means having ends engaging said articulated lever systems;

(g) wherein said articulated lever systems are arranged with one end thereof on said press stand so that their height can be adjusted relative to said press stand;



(h) wherein said articulated lever systems are pivotally mounted with the other end thereof in said press slide;

(i) wherein said press further includes means for adjusting the working range of said press slide attached to said press stand; and

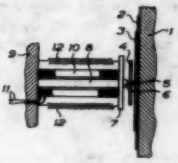
(j) wherein said means for adjusting the working range include guide beams provided on their lower surface with bearings for the suspension of said one end of each lever system, said beams being adjustably mounted on said press stand.

4,944,222

PRINTER DEVICE WITH NOISE REDUCING IMPACT HAMMER

Carl H. Tyrén, Malmö , Sweden, assignor to Atech Aktiebolag, Götegorg, Sweden

Continuation of Ser. No. 157,642, Feb. 18, 1988, abandoned, which is a continuation of Ser. No. 58,693, Jun. 3, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,379
Claims priority, application Sweden, Jan. 30, 1984, 8400439
Int. Cl.[5] B41J *9/00*
U.S. Cl. 101—93.29 **5 Claims**



1. In an impact printer device having,

a striking member,

an abutment supporting a paper thereon,

an ink ribbon disposed between said striking member and said paper supporting abutment, said striking member by striking action transmitting a print to said paper via said ink ribbon,

at least one motion generator unit comprising a rod of a giant magnetostrictive material consisting of an alloy of rare

earth metals and one of the substances iron, cobalt and nickel,

a supporting structure fixedly supporting one end of said rod, the opposite end of said rod being fixed to said striking member,

a magnet coil surrounding said motion generator unit,

a source of electric current,

the improvement comprising means for reducing the noise generated from said printer, said noise reducing means including control means for first supplying an electric current to said magnetic coil to bring said striking member in close proximity to said paper, striking means for driving said striking member toward said paper and ink ribbon at a reduced speed less than that used in reaching said close proximity, after said control means has brought said striking member into said close proximity.

4,944,223

MECHANISM FOR CONTINUOUSLY SUPPLYING DAMPENING MEDIUM IN OFFSET PRINTING MACHINE

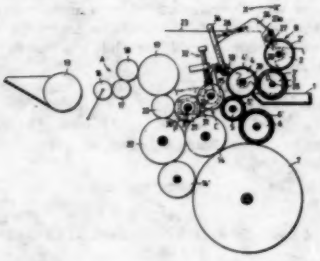
Koji Ishii, and Naoki Ikeda, both of Fuchu, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed May 15, 1989, Ser. No. 352,236

Claims priority, application Japan, May 16, 1988, 63-64850[U]

Int. Cl.[5] B41L 23/00

U.S. Cl. 101—148 5 Claims



1. In a mechanism for continuously supplying a dampening medium in an offset printing machine, the offset printing machine including a stationary frame, a plate cylinder for mounting thereon a master plate, an inking unit for applying an ink to the master plate, and a dampening unit having a dampening medium fountain for applying a dampening medium onto the master plate, the dampening unit comprising a roller train including a dampening medium applicator roller in rotational contact with the master plate, a dampening medium transfer roller in rotational contact with the applicator roller, and a plurality of rollers bridging the fountain and the dampening medium transfer roller, dampening medium in the fountain being applied onto the master plate through the roller train, the improvement wherein:

the dampening medium transfer roller is rotatably supported by the stationary frame;

the dampening medium transfer roller and the dampening medium applicator roller comprise elastic layers at respective outer peripheral surfaces thereof; and

the plurality of rollers have one of a hydrophilic metal layer and an elastic layer at respective outer peripheral surfaces thereof, wherein adjacent ones of said rollers have different outer peripheral surface layers; and

means, having first and second positions, for selectively connecting said inking unit and said dampening unit, said inking unit contacting said dampening unit at said first position of said means, for applying dampening medium to said inking unit, and said inking unit being out of contact with said dampening unit at said second position of said means, for applying dampening medium to the master plate only through the dampening medium applicator roller.

4,944,224

ELECTRICAL IGNITING MEDIUM

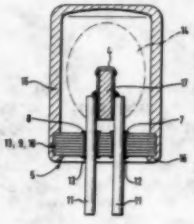
Kurt Fiedler, Diepersdorf; Bernhard Kratz, Wendelstein; Gerhard Kordel, Nurnberg, and Gerrit Scheiderer, Furth, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nurnberg and Dynamit Nobel Aktengesellschaft, Troisdorf, both of, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 337,616

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3812958

Int. Cl.[5] F42B 3/18, 3/182

U.S. Cl. 102—202.2 12 Claims



1. Electrical detonator or igniting medium, comprising a support member; electrical lead lines extending towards a detonator bridge and passing through said support member, said support member forming a shunt-capacitance which is connected to the lead lines for the detonator bridge, and said shunt-capacitance including ceramic layers which are equipped with electrodes.

4,944,225

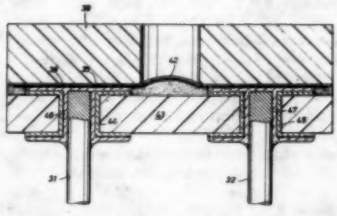
METHOD AND APPARATUS FOR FIRING EXPLODING FOIL INITIATORS OVER LONG FIRING LINES

James M. Barker, Katy, Tex., assignor to Halliburton Logging Services Inc., Houston, Tex.

Continuation-in-part of Ser. No. 175,961, Mar. 31, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 433,305

Int. Cl.[5] F42B 3/10; F42C 19/12

U.S. Cl. 102—202.5 13 Claims



1. An initiator for detonation of an elongate explosive cord extending to plural shaped charges in a well borehole, the initiator comprising:

(a) a closed housing connected to an elongate explosive cord;

(b) secondary explosive charge means in said housing positioned relative to said explosive cord to detonate said cord and wherein said charge means has an exposed face;

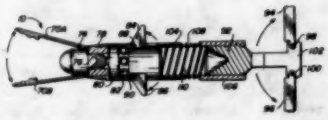
(c) a transverse structural member disposed against said exposed face and having a passage therein wherein said passage has a face end against said exposed face and spaced from a remote end;
(d) a sheet member of electrically insulated material spanning said remote passage end and attached to said structural member by an adhesive means;
(e) a sacrificial metal foil member adjacent to said sheet member and aligned with said passage end;
(f) a pair of electrical conductors connected into said housing for electrical connection to said metal foil to deliver current through said housing to vaporize said foil on sufficient current flow; and
(g) wherein said housing confines vaporization of said metal foil to cause detonation through said passage toward said charge means face.

4,944,226

EXPANDABLE TELESCOPED MISSILE AIRFRAME

Larry D. Wedertz, Alta Loma; Jose R. Vazquez, Rancho Cucamonga, and Scott R. Schoneman, Ontario, all of Calif., assignors to General Dynamics Corp., Pomona Div., Pomona, Calif.

Filed Aug. 19, 1988, Ser. No. 234,764
Int. Cl.[5] F42B *13/02*
U.S. Cl. 102—476 **18 Claims**



1. An expandable airframe for a missile carrying a shaped charge comprising:
an aerodynamic front portion;
a rear portion; and
an extendible telescoping portion connected between said front and rear portions, contained within said front portion in a first, stowed configuration and extending rearwardly from said front portion in a second, deployed configuration;
wherein an increased distance between a frontmost tip of said front portion and said shaped charge following transition from said first to said second configuration results in more effective penetration by said shaped charge into a target subsequent to detonation of said shaped charge.

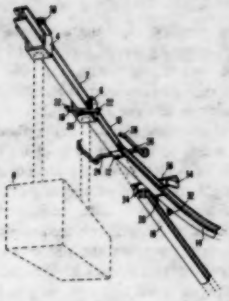
4,944,227

RAIL TRANSPORTATION SYSTEM WITH SWITCHES

Holger Madsen, Skjern, Denmark, assignor to ALFA-Laval Agri Scandinavia A/S, Skjern, Denmark

PCT No. PCT/DK88/00029, § 371 Date Oct. 20, 1988, § 102(e) Date Oct. 20, 1988, PCT Pub. No. WO88/06206, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 18, 1988, Ser. No. 264,278
Claims priority, application Denmark, Feb. 20, 1987, 862/87
Int. Cl.[5] E01B *25/26*; B61B *3/00*; B61L *5/02*
U.S. Cl. 104—103 **5 Claims**

1. A rail transportation system comprising at least one rail switch having a switchable rail member which is switchable for connecting different rail sections of the system and at least one carrier which is controlled to operate according to a predetermined program, said carrier and said rail member being provided with cooperating engagement means for effecting relevant shifts of the rail member by a force derived from the motion of the carrier, said engagement means of said carrier being selectively shiftable between an operative and a non-operative position, the system further comprising actuator means operable to selectively shift these engagement means between said positions for enabling the carrier to carry out movements in the system in accordance with the predetermined program, and wherein said actuator means are constituted by fixed abutment members mounted at selected places along rail section of the system for cooperation with the engagement means of the moving carrier in such a manner that he



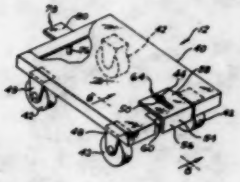
carrier, when moved forwardly and rearwardly in the system in a controlled, preprogrammed manner, interacts with the said abutment members to the effect that the carrier is thereby automatically controlled to move in compulsory accordance with the predetermined program.

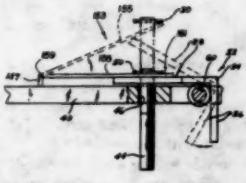
4,944,228

CONVEYOR SYSTEM

Arthur B. Rhodes, 3347 Camp Ground Rd., Louisville, Ky. 40211

Continuation-in-part of Ser. No. 270,102, Nov. 14, 1988. This application Apr. 13, 1989, Ser. No. 337,478
Int. Cl.[5] B61B *10/04*
U.S. Cl. 104—172.3 **11 Claims**





1. A load carrying unit for selected movement along a conveying path defined by an endless conveyor chain, comprising:
a frame structure;
floor engaging wheels rotatably attached to the frame structure;
a depending movable conveyor chain engagement pin attached to the frame structure near the front end of the frame structure movable between a lowered chain engaged position whereat the depending end of the pin engages the conveyor chain and a raised, chain disengaged position whereat the depending end of the pin is spaced above and out of contact with the conveyor chain;

pin moving means structurally associated with the pin and mounted to the front end of the frame structure for pivotable movement about an axis perpendicular to the longitudinal axis of the pin to move the pin between the lower chain engaged position and raised chain disengaged position; and,

pin stabilizing means comprising a pin stabilizing plate, an upstanding mounting flange attached to the frame structure, hinge means interconnecting the top end of the mounting flange and one end of the stabilizing plate with its pivot axis spaced from and parallel to the pivot axis of the pin moving means, the stabilizing plate extending from the hinge means to the conveyor chain engagement pin, means defining a slot at the distal end of the stabilizing plate having a minor dimension slightly larger than the diameter of the conveyor chain engagement pin and with a major dimension coaxial with the longitudinal axis of the stabilizing plate receiving the top end of the conveyor chain engagement pin, and a keeper affixed to the top end of the conveyor chain engagement pin above the distal end of the stabilizing plate.

4,944,229

AUTOMOTIVE CARRIER TYPE CONVEYING APPARATUS

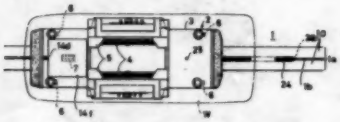
Masayasu Arakawa; Teruhisa Katsumata and Yoshimasa Ota, all of Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 342,194

Claims priority, application Japan, Apr. 27, 1988, 63-102640; Apr. 30, 1988, 63-108331

Int. Cl.[5] B61B *13/00*

U.S. Cl. 104—137 **12 Claims**



1. A self-propelled carrier type conveying apparatus having a conveying carrier which travels along a self-propelled conveying passage, comprising:

a pit formed at the widthwise central portion of the conveying passage;

a guide rail laid within the pit;

a track formed to cover a top side of the pit and be flush with a road surface of the conveying passage, said track having a slit formed at the widthwise center of the track, said slit communicating with the pit;

a conveying carrier having a carrier body;

a plurality of wheels attached to the conveying carrier and contacting the road surface of the conveying passage, at least the wheels adjacent a front of the carrier being casters;

a steering frame pivotally supported on the conveying carrier and turnable about a vertical steering axis line;

a driving wheel and a motor for driving the driving wheel, both of which are attached to the steering frame, said driving wheel being so positioned as to contact the track at a location substantially directly below said vertical steering axis line; and

a guide member which is guided by the guide rail for movement and connected to the steering frame through the slit.

4,944,230

CONVEYOR APPARATUS USING AUTOMOTIVE CART

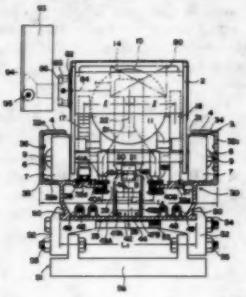
Hajime Maeda, Kasugai, and Masayuki Tsuneda, Komaki, both of Japan, assignors to Daifuku Co., Ltd., Japan

Continuation of Ser. No. 208,149, Jun. 17, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 453,332

Claims priority, application Japan, Aug. 3, 1987, 62-194118; Nov. 13, 1987, 62-173524[U]

Int. Cl.[5] B61C *13/00*; B61F *13/00*; E01B *25/22*

U.S. Cl. 104—139 **2 Claims**



1. A conveyor apparatus including an automotive cart and a rail device for supporting and guiding said automotive cart:

said rail device comprising an automotive cart guiding member having a C-shaped section provided with an open portion for the passage of said automotive cart therethrough,

a duct member connected to the wall of said guiding member opposite to said open portion thereof,

said wall having edge members defining a slit through said wall providing communication between said duct member and said guiding member,

feeding rail means mounted on each of said edge members for feeding electric power to said automotive cart,

said automotive cart having frictionally propelling rotary wheel means for driving said automotive cart and having pinion drive means,

a pair of guide surface means formed on said guiding member on opposite sides of said slit and extending in the direction of length of the rail device,

rack means detachably mounted on one of said guide surface means and engageable with said pinion drive means,

said feeding rail means comprising an insulating rod member formed of resins and applied on one of said edge members, and

a feeding rail applied on said rod member.

4,944,231

MOBILE STORAGE SYSTEM WITH DRIVING ASSEMBLIES

Alan R. Leist, Grand Rapids, Mich., assignor to Pipp Mobile Systems, Inc., Grand Rapids, Mich.

Filed Feb. 29, 1988, Ser. No. 162,644

Int. Cl.[5] B61C *11/00*

U.S. Cl. 104—287 **30 Claims**

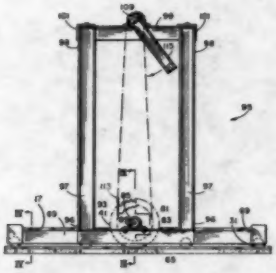
1. A mobile storage system for movably supporting a mobile storage unit comprising:

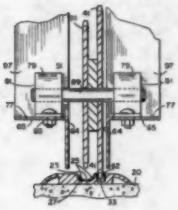
at least one track member of a one-piece unitary construction having an upper surface, said upper surface a defining a longitudinal guideway extending the length of said track member and a series of openings aligned longitudinally along the length of said track member to thereby define a row of openings substantially parallel with said guideway;

at least one support structure having means for supporting a mobile storage unit, and including a plurality of support-

ing rollers which are received in said guideway for movably supporting said support structure on said track member;

a driving sprocket rotatably mounted on said support structure directly over said series of openings on said track member, said driving sprocket having a plurality of radially extending teeth spaced apart a predetermined distance





such that said teeth are sequentially received within said openings as said driving sprocket is rotated; and

drive means for rotating said driving sprocket such that said support structure is moved along said track member as said driving sprocket is rotated, whereby said mobile storage unit is easily moved along the length of said track member.

4,944,232

DUAL-PURPOSE DEPRESSED CENTER RAILWAY FLAT CAR

Gary D. Schlaeger, Springtown, Tex., assignor to Burlington Northern Railroad, a wholly owned subsidiary of Burlington Northern, Inc., Fort Worth, Tex.

Filed Apr. 25, 1989, Ser. No. 343,036
Int. Cl.[5] B61F *1/00*; B60P *3/42*
U.S. Cl. 105—355 **14 Claims**

1. A dual purpose railway flat car for hauling a variety of ladings, said car comprising:

(a) a frame having a first end section, a middle section and a second end section;

(b) first and second trucks, having wheels, cooperatively connected to said first and second sections respectively adapted to be supported on railroad tracks;

(c) first, second and middle floor members cooperatively connected to said first, second and middle sections respectively;

(d) a first bulkhead cooperatively connected to one end of said frame and a second bulkhead cooperatively connected to a second end of said frame;

(e) a first integral structural cradle cooperatively connected to said frame positioned between said first section and said middle section;

(f) a second integral structural cradle cooperatively connected to said frame positioned between said second section and said middle section; and

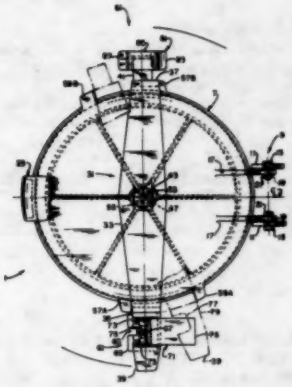
(g) said middle floor member positioned lower than said first and second members, thereby form a depressed center, said cradles configured to carry cylindrical objects and also to form integral intermediate bulkheads for said depressed center, wherein said car may be used to carry a variety of ladings including polygonal containers and forest products.

4,944,233

HATCH ARRANGEMENT FOR COVERED HOPPER CARS

Richard H. Dugge, St. Louis County, Mo., and John W. Coulborn, Harris County, Tex., assignors to ACF Industries, Incorporated, Earth City, Mo.

Filed Jun. 12, 1989, Ser. No. 364,872
Int. Cl.[5] B61D *39/00*; B65D *45/00*
U.S. Cl. 105—377 **15 Claims**



1. A hatch cover assembly for a railway car comprising:

a hatch cover hingedly mounted to a roof of the car for pivotal movement of the cover to open and close a hatch formed in the roof, the hinge axis about which pivotal movement of the cover occurs being perpendicular to a center line of the car;

a locking strap pivotally mounted atop the hatch cover for movement between a cover locking position and a cover unlocking position, movement of the strap to its cover locking position preventing movement of the cover to open the hatch, the longitudinal axis of the strap when in the cover locking position being substantially perpendicular to the center line of the car; and,

latching means adjacent the cover for latching the strap in its cover locking position to prevent movement of the strap whereby the orientation of the strap with respect to the center line of the car and the location of the latching means permits the hatch cover assembly to have a substantially lower profile with respect to the roof of the car than conventional hatch cover assemblies thereby allowing the roof of the car to be raised which, in turn, increases to load carrying capacity of the car.

4,944,234

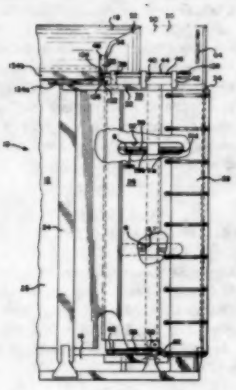
RAIL CAR END ASSEMBLY

Harold E. Hesch, St. John, Ind., assignor to Trinity Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 65,948, Jun. 24, 1987, abandoned. This application May 12, 1989, Ser. No. 352,715

Int. Cl.[5] B61D *17/06*

U.S. Cl. 105—378 **30 Claims**



1. A rail car end assembly comprising:

a pair of substantially straight and continuous side walls defining a space therebetween and having

top and bottom arcuate tracks;

a pair of rigid two-panel doors each having two panels for closing the space between the side walls and riding along the top and bottom arcuate tracks between open and closed positions;

said doors in the open position being located between said side walls and,

said two panels of each door defining a V-shaped recess for admitting therein and bypassing laterally inward portions of the end assembly as the doors move between closed and open positions.

4,944,235

ATTACHMENT MECHANISM FOR ATTACHING A DESK TOP TO A SUPPORT STRUCTURE

Eitelfriedrich Jahnke, Korbach, and Detlef Hänsel, Lippstadt-Dedinghausen, both of Fed. Rep. of Germany, assignors to Gesika Buromobelwerk GmbH & Co. KG, Geseke, Fed. Rep. of Germany

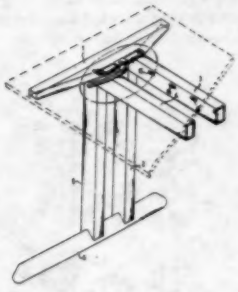
Filed Oct. 11, 1989, Ser. No. 420,066

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835365

Int. Cl.[5] A47B *3/06*

U.S. Cl. 108—157 **10 Claims**

1. A desk comprising a support structure and a desk top adapted to be mounted on said support structure, said support structure including a pair of vertical pedestals disposed in spaced relation to one another and a pair of elongated horizontally extending parallel cross beams disposed between said pedestals adjacent the tops when said desk top is mounted on said support structure of said pedestals at a location below said desk top, each of said cross beams including abutment means thereon, and the underside of said desk top including an attachment mechanism thereon for separably attaching said desk top to said support structure, said attachment mechanism comprising a manually operable latching lever mounted for pivotal motion in a plane parallel to the underside of said desk top, a pair of clamp levers mounted for horizontal linear motion toward and away from one another in a direction transverse to said elongated cross beams, and motion changing means responsive to pivotal motion of said latching lever in one direction for effecting linear motion of said clamp levers into engagement with said abutment means on said cross beams, and



responsive to pivotal motion of said latching lever in a direction opposite to said one direction for disengaging said clamp levers from said abutment means.

4,944,236

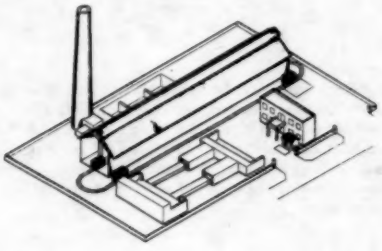
TUNNEL TYPE GARBAGE INCINERATOR

Chao-Chin Sheen, 283, Sec. 4, Fu-Hsin Rd., Taichung, Taiwan

Filed Aug. 24, 1989, Ser. No. 398,274

Int. Cl.[5] F23G *5/00, 5/12, 5/44*

U.S. Cl. 110—257 **3 Claims**



1. A tunnel type garbage incinerator which is characterized in that all of the component structures of this incinerator are constructed and deployed on a land area, comprising:

a garbage classification plant furnished with a crushing unit, a metal selecting unit, and a gravel sifting unit;

an incinerating tunnel having a length of about 120 to 140 meters;

a plurality of bogies;

an endless rail track passing through the said incinerating tunnel for guiding the travel of the bogies;

each bogie being provided with a fire brick platform, the upper portion of each bogie above the said platform being wider than the wheel track beneath it and closely encased by two adjacent side walls of the incinerating tunnel when the bogie travels into the incinerating tunnel, the middle section of the incinerating tunnel being an incinerating chamber, and a plurality of flame nozzles provided on the upper portions of each side wall, the tail section near the outlet port of the said incinerating tunnel being provided with a plurality of fresh air blowers, the fore section near the input port of the incinerating tunnel being provided with an exhaust gas outlet port;

a water rinsing pool and a smokestack;

and wherein the exhaust gases generated in the incinerating

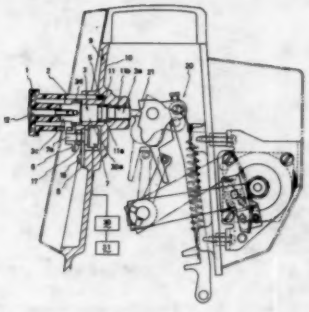
chamber are sucked out from the incinerating tunnel into the smokestack for emission into the air after passing through the water rinsing pool and the smokestack water rinsing device for filtering out smoke, solid particles and bad smelling gases contained in the untreated exhaust gases.

4,944,237

DETECTING DEVICE OF THE FEEDING QUANTITY IN A SEWING MACHINE

Shiro Nonaka, Kariya; Seiichiro Hagino, Chiryu, and Tsukasa Ando, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 31, 1989, Ser. No. 331,168
Claims priority, application Japan, Mar. 31, 1988, 63-80922
Int. Cl.[5] D05B *27/22, 35/12*
U.S. Cl. 112—315 **3 Claims**



1. A detecting device of the feeding quantity of material in a sewing machine, comprising:

a normally stationary dial rotatably mounted on an arm of the sewing machine;

mechanical means operatively connected to the dial for varying the feeding quantity in response to the rotational quantity of the dial, wherein said means for varying the feeding quantity comprises an adjusting member fixed to said dial and threaded into said arm, and wherein a portion of said adjusting member engages a feeding quantity adjusting mechanism of the sewing machine;

signal generator means for converting the rotational quantity of the dial into electric signals, wherein the signal generator means includes a microprocessor independent of said means for varying the feeding quantity, and a variable resistor having an output connected to the microprocessor and having a shaft rotated by the rotation of said dial; and

display means electrically connected to the signal generator means for displaying signals outputted therefrom.

4,944,238

SEMI-SUBMERGED SHIP

Thomas G. Lang, 417 Loma Larga Dr., Solana Beach, Calif. 92075

Continuation of Ser. No. 233,261, Aug. 17, 1988, abandoned. This application Dec. 6, 1989, Ser. No. 447,206
Int. Cl.[5] B63B *1/12, 1/14*
U.S. Cl. 114—61 **33 Claims**

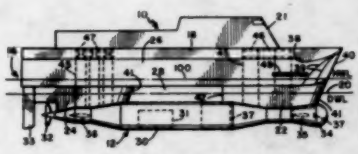
1. A semi-submerged ship, comprising:

a pair of parallel submerged hulls whose centers are spaced apart by at least two hull widths;

a strut structure extending upwardly from the hulls on each side of the ship;

a cross-structure connected across the upper regions of the strut structure to connect the opposite sides of the ship together;

the strut structure on each side comprising two lower struts extending upwardly from the hull on that side and a single, full length upper strut attached to the upper ends of the lower struts, each upper strut having a transverse width at its upper end which is no narrower than the width of the remainder of the upper strut, the upper struts lying above the operational design water line at least in the region midway between the lower struts;



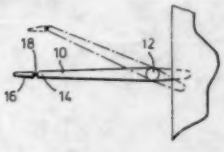
the lowermost portion of each upper strut in the region midway between the lower struts being no lower than the lowermost portion of the upper strut lying directly above the forward lower strut; and each hull having an enlarged cross-section which extends into the region between the lower struts.

4,944,239

FLAP RUDDER AND STEERING SYSTEM

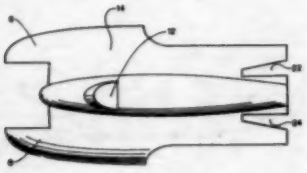
John S. McKenzie, 4039 Violet Street, North Vancouver, British Columbia, Canada

PCT No. PCT/GB87/00022, § 371 Date Nov. 15, 1988, § 102(e) Date Nov. 15, 1988, PCT Pub. No. WO88/05395, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 15, 1987, Ser. No. 250,680
Int. Cl.[5] B63H *25/06*
U.S. Cl. 114—162 **13 Claims**



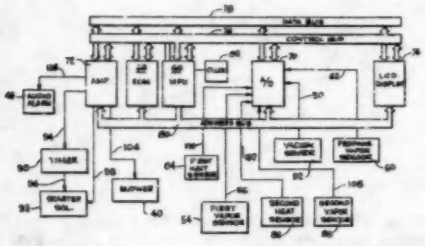
1. An active flap steering system for a towed vessel (34) having a rudder (10) mounted for swivelling movement about a rudder axis (12), characterized in that there is provided an active flap rudder extension (16) controlled for independent oscillation by an active flap actuator (18) that imparts a turning force to swing the flap rudder extension (16) with respect to the rudder (10) in a first direction, causing the extension (16) and the rudder (10) to swing together in a direction opposite to said first direction, said active flap actuator (18) forming part of an automatic control system between a towing vessel (38, 90) and the towed vessel (34, 92), said control system including means mounted on said towed vehicle and responsive to deviations of said towed vehicle from a preset towed path, for activating said automatic control system for actuating said active flap actuator and adjusting said active flap rudder extension for resetting said towed vehicle to said preset path.

4,944,240
HULL FOR WATER CRAFT
James K. Morris, 312 N. Stadium Way #402, Tacoma, Wash. 98403
Continuation of Ser. No. 816,151, Jan. 3, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 224,493
Int. Cl.[5] B63B 1/12
U.S. Cl. 114—283 3 Claims



1. A hull for a hydroplane boat comprising: two longitudinal sponsons establishing the buoyancy of the hull at either side of an interconnecting hull portion wherein the interconnecting hull portion includes two cutouts which extend through the entire height of the hull and are positioned equidistant from the centerline of said hull, each of said cutouts having a straight side parallel to the longitudinal axis of the boat extending from the bow towards the stern, a second side extending generally perpendicular to said first side, with a third side extending back to the stern at an angle which steadily increases the width of the cutout as it extends aft and terminates at the stern thereby leaving an open aft.

4,944,241
ENGINE VACUUM-CONDITION RESPONSIVE SAFETY SYSTEM
John A. Carter, 40 Williams La., Foster City, Calif. 94404
Filed Jul. 26, 1989, Ser. No. 385,772
Int. Cl.[5] B63J 2/06
U.S. Cl. 114—211 18 Claims



1. A safety system for ventilation of a marine engine compartment having a ventilating device for exhausting gas therefrom, said compartment housing a marine engine, said safety system comprising,

means for sensing a specified engine vacuum condition, said sensing means having an input operatively connected to said marine engine to detect vacuum pressure associated therewith and having an output, and

control means operatively connected to said output for activating and deactivating said ventilating device in response to said sensing of vacuum pressure, said control means activating said ventilating device upon detection of said specified engine vacuum condition.

4,944,242
RESCUE BALLOON
Donald H. Russell, P.O. Box 1282, Imperial Beach, Calif. 92032
Continuation of Ser. No. 186,584, Apr. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 908,807, Sep. 17, 1986, abandoned. This application Jan. 18, 1990, Ser. No. 469,743
Int. Cl.[5] B64B 1/50
U.S. Cl. 116—210 2 Claims

1. A rescue or signaling device comprising, in combination:

a lifting body balloon including filling means and sealing means;

a pressurized vessel of lighter-than-air gas including a necked down portion;

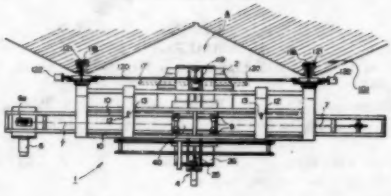
valving means attached to said pressurized vessel necked down portion for filling said lifting body balloon with lighter-than-air gas from said pressure vessel; and

tethering means attached to said lifting body balloon for tethering said filled lifting body balloon such that air flowing past said balloon when tethered produces a lifting force; said tethering means including:

a tether line; and

a friction spool upon which said tether line is wound; said friction spool attached to said pressurized vessel necked down portion for preventing said tether line from freely playing out.

4,944,243
APPARATUS FOR AUTOMATICALLY PAINTING EXTERNAL WALL OF BUILDING
Masahiro Takeno, Hasuda; Yoshihito Sakai, Saganihara, and Atsushi Shirato, Kawaguchi, all of Japan, assignors to Taise Corporation, Tokyo, Japan
Filed Jun. 21, 1989, Ser. No. 369,187
Int. Cl.[5] B05C 1/02, 5/00
U.S. Cl. 118—305 9 Claims



1. A system for automatically painting the external wall of a building, the external wall having two guide grooves formed along a vertical direction, the system comprising:

(a) a support suspended from a hoist apparatus, the hoist apparatus being disposed above the exterior wall, said support having a device for determining the horizontal

position of said support, said horizontal position determining device having elements disposed within the guide grooves; and

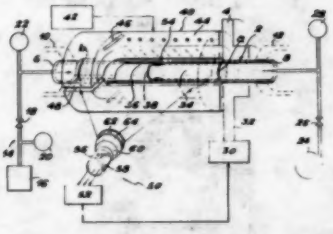
(b) a painting apparatus suspended by said support, said support including moving means which enable said painting apparatus to move in a horizontal direction, said painting apparatus including a painting hood having a spray gun disposed therein, said painting apparatus having means for advancing and retracting said painting hood in a direction normal to said external wall.

4,944,244

APPARATUS FOR THE PRODUCTION OF PREFORMS FOR OPTICAL FIBERS

Monique Moisan; Dominique Pavy, both of Lannion; Marie-Eve Davoust, Michel S/Orge; Serge Saada, Kremlin-Bicetre, and Patrick Chollet, Les Ulis, all of France, assignors to Etat Francais Represente Par Le Ministere Des Postes, Issy Les Moulineaux, France

Filed Mar. 14, 1989, Ser. No. 323,623
Claims priority, application France, Mar. 16, 1988, 88 03392
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—723 15 Claims



1. Apparatus for the production of preforms for optical fibers comprising means for depositing on the inner surface of a glass tube (2) a vitreous coating serving for the subsequent formation of the core of the optical fibers, said means comprising:

means (16, 24) for continuously passing from a first end (6) of the tube to the second end (8) of the tube, a mixture of ionizable gaseous compounds able to bring about the formation of the coating by reacting with one another,

an ultra-high frequency coupler (4) located on the side of the second end (8) of the tube and provided for forming in said tube a plasma column (34) for activating the reaction, said ultra-high frequency coupler being able to inject a travelling surface wave into the plasma column, and

a variable power microwave generator (30) for supplying the ultra-high frequency coupler (4) with an electromagnetic power and for continuously and progressively varying said power, in such a way that the end (38) of the plasma column (34) sweeps the tube, the vitreous coating deposit taking place at a given time in a deposition area (54) emitting a light characteristic of the reaction and which is located in the plasma column in the vicinity of the end thereof,

characterized in that the apparatus also comprises:

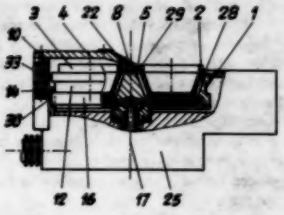
photodetection means (50) sensitive to said light and able to supply information relative to the position of the deposition area, and electronic means (52) for controlling the displacement of the deposition area, said displacement being such that the thickness of the coating is uniform, control means being provided for controlling the power of the generator (30) as a function of information supplied by the photodetection means (50).

4,944,245

CRUCIBLE COVER FOR COATING INSTALLATION WITH AN ELECTRON BEAM SOURCE

Wilfried Stoesel, Götzis, Austria; Christian Bausch, Triesenberg, Liechtenstein; Martin Boesch, Azmoos, Switzerland, and Peter Niggli, Vaduz, Liechtenstein, assignors to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Filed Jan. 16, 1990, Ser. No. 464,941
Claims priority, application Switzerland, Sep. 2, 1989, 445/89
Int. Cl.[5] C23C *14/00*
U.S. Cl. 118—726 15 Claims



1. A crucible cover assembly for a coating apparatus having an electron beam as an energy source for heating material to be vaporized, comprising:

a support block;

a crucible mounted for movement to said support block and having a surface with a plurality of material pockets therein;

a cover for covering at least one of the material pockets which are not to be heated by the energy source, said cover having at least one edge with a seal engageable with the crucible surface for sealing the cover to the crucible for covering the at least one material pocket; and

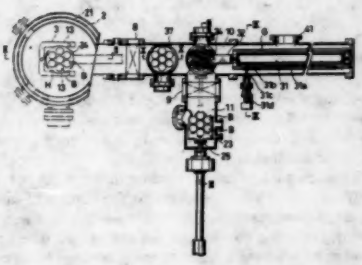
a lifting mechanism operatively connected between said crucible and said cover for changing the distance between said cover and the crucible surface when the crucible moves for moving said seal away from the crucible surface so that a different material pocket can be moved, with movement of said crucible, under the cover.

4,944,246

MOLECULAR BEAM EPITAXY APPARATUS

Haruo Tanaka, Shiga; Masato Mushiage, Kyoto, and Yuhji Ishida, Osaka, all of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Mar. 27, 1989, Ser. No. 329,313
Claims priority, application Japan, Mar. 30, 1988, 63-42830[U]; Mar. 30, 1988, 63-77798[U]; Apr. 8, 1988, 63-87918
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—729 17 Claims



7. A molecular beam epitaxy apparatus comprising:

a growth chamber evacuatable to an ultra high vacuum,
holder support means arranged in said growth chamber,
a preparation chamber connected to said growth chamber via a first gate valve and evacuatable to a high vacuum,
a loading chamber connected to said preparation chamber via a second gate valve and evacuatable to a high vacuum,
a first transfer member arranged in said loading chamber for receiving at least one substrate at a time, said first member being movable into said preparation chamber through the open second valve to assume an advanced transfer position,
a second transfer member arranged in said preparation chamber for placing thereon a substrate holder, said second member being movable from a retreated transfer position in said preparation chamber into said growth chamber through the open first valve to enable transfer of the holder between said second member and said holder support means, and
a substrate transfer assembly arranged in said preparation chamber to transfer the, or each, substrate between said first member in said advanced transfer position and the holder placed on said second member in said retreated transfer position,
further comprising a preliminary heating unit arranged in said preparation chamber between said growth chamber and said retreated position of said second transfer member for degassing the substrate held by the holder before entry into the growth chamber,
wherein said preliminary heating unit comprises a stocker for storing a plurality of substrate holders in vertically spaced stages, and
wherein each stage of said stocker is provided by a pair of shelf plates which are spaced transversely of the moving path of said second transfer member, said pair of shelf plates being engageable with a corresponding substrate holder from below but spaced enough to allow passage of said second transfer member.

4,944,247
ANIMAL LITTER
Billy G. McNish, Little Rock, and Jarvis Harper, Benton, both of Ark., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 7, 1986, Ser. No. 837,186
Int. Cl.[5] A01K *1/015*
U.S. Cl. 119—1 **3 Claims**

1. The method of using sinter by-product, formed during a sinter-leach process that captures aluminum oxide from Bayer process residue, comprising placing it in a sized and dried form as litter for animals.

4,944,248
POLYGEN FISH GLOBE
Chen Ching Torng, 10F No. 50 Sung Chiang Rd., Taipei, Taiwan
Filed Jul. 20, 1988, Ser. No. 221,985
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 **3 Claims**

1. An aquarium comprising:
a tank having a bottom and upstanding walls one of the walls defining a port disposed adjacent the bottom;
a mesh shelf disposed within said tank and spaced above the bottom and above the port, said shelf adapted to support a layer of small stones;
an elongated suction tube extending through the port and of sufficient length to extend across the bottom of said tank, said tube terminating at the end inside the tank in a downwardly opening nozzle, and the end of said tube opposite said nozzle having a drain opening adapted to be coupled to a source of reduced pressure so that debris on the bottom will be sucked through the nozzle and expelled through the drain;
valve means coupled to said tube for opening and closing the drain opening therein; and

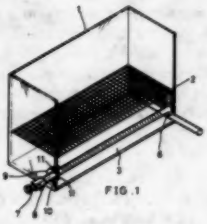
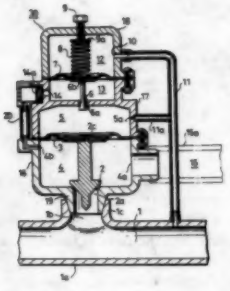


FIG. 1

resilient seal means for sealing engagement between the exterior of said tube and said port for permitting sliding and lateral movement of said tube without leakage.

4,944,249
VACUUM-PRESSURE SUPPLY DEVICE
Toru Takeuchi, and Minoru Matsuzawa, both of Suzaka, Japan, assignors to Orion Machinery Co., Ltd., Nagano, Japan
Filed Jul. 12, 1988, Ser. No. 218,235
Int. Cl.[5] A01J *5/04*
U.S. Cl. 119—14.44 **2 Claims**



1. A vacuum pressure supply device for a dual pressure cow milking arrangement, comprising:
casing members defining a first hollow space and a second hollow space separated from said first hollow space by a wall member;
a first diaphragm cooperating with said casing members to define a first chamber and a second chamber in said first hollow space;
a second diaphragm cooperating with said casing members to define a third chamber and a fourth chamber in said second hollow space;
a high vacuum pressure pipe having a vacuum pump connected at one end to provide a pressure below atmospheric pressure and a milking arrangement in communication with a low vacuum pressure pipe pressure in said low vacuum pressure pipe being below atmospheric pressure and above said pressure in said high vacuum pressure pipe;
a pressure adjusting hole formed in said casing communicating with said high vacuum pressure pipe;
a first chamber valve body having one end secured to said first diaphragm and a second end positionable in said pressure adjusting hole to restrict said pressure adjusting hole an amount dependent upon the displacement of said first diaphragm;
a high vacuum pressure line connected to said high vacuum

pressure pipe and connected to said second chamber and said fourth chamber;

an air-induction hole formed in said wall member providing communication between said second chamber and said third chamber;

a pilot valve connected to said second diaphragm and positioned in said air induction hole for adjusting an amount of air flowing through said air induction hole from said third chamber into said second chamber in dependence upon the displacement of said second diaphragm;

said third chamber being formed with an open portion for communication with one of atmospheric air and said first chamber; and

resilient means for supporting said second diaphragm by resilient force.

4,944,250

CYCLONE SEPARATOR INCLUDING A HOPPER FORMED BY WATER-STEAM COOLED WALLS

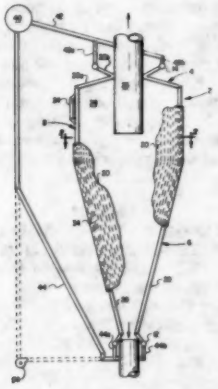
Venkatraman Seshamani, Gillette, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Mar. 30, 1989, Ser. No. 330,541

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[5] B04C *5/08*

U.S. Cl. 122—20 B **7 Claims**



1. A cyclone separator comprising an inner cylinder; a plurality of tubes, the intermediate portions of said tubes extending vertically and circumferentially in a parallel relationship to form an outer cylinder extending around said inner cylinder in a coaxial relationship to define an annular chamber between said cylinders, the upper end portions of aid tubes being bent radially inwardly to form a roof section, and the lower end portions of said tubes being bent radially inwardly to form a conical shaped hopper section; a first ring header connected to the upper ends of said tubes; a second ring header connected to the lower ends of said tubes; means for passing water or steam or a water and steam mixture through said ring headers to circulate said water or steam or water and steam mixture through said tubes to cool said separator; and means for directing gases containing solid particles through said annular chamber for separating the solid particles from said gases by centrifugal forces, the separated gases exiting through said inner cylinder and the separated solids falling to the bottom of said hopper section for disposal or recycle.

4,944,251

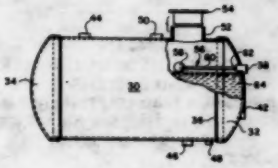
CONDENSATE RETURN TANKS

Richard Fetterly, Fulton, N.Y., assignor to Fulton Boiler Works, Inc., Pulaski, N.Y.

Filed Mar. 3, 1989, Ser. No. 318,734

Int. Cl.[5] F22D *5/26*

U.S. Cl. 122—451 R **5 Claims**



1. A condensate return tank for storing and condensing water in a closed loop steam system, comprising a horizontally arranged generally cylindrical tank closed at each end, a float valve comprising a ball attached at one end to a lever arm which is itself attached at its other end to a pivotal fitting secured to the inner surface of one of the ends of said tanks so that said ball extends cantilevered therefrom to float on the surface of the water in said tank, an opening on the surface of said horizontally disposed tank, adjacent the one end of said tanks and spaced therefrom by a distance permitting manual entry into the tank in contact with said float valve, and a cap resting on and forming an air vent permitting escape of air from said tank.

4,944,252

REHEAT TYPE EXHAUST GAS BOILER

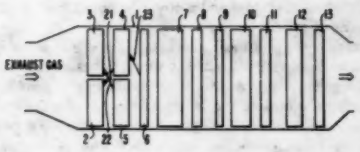
Toshiki Motai, and Masamichi Kashiwazaki, both of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 412,323

Claims priority, application Japan, Jul. 25, 1988, 63-183677

Int. Cl.[5] F22G *7/12*

U.S. Cl. 122—470 **2 Claims**



1. A reheat type exhaust gas boiler comprising:

an exhaust gas boiler main body through which exhaust gases are adapted to flow in a generally longitudinal direction;

a high-temperature side superheater and a high-temperature side reheater mounted in parallel in a most upstream portion of said main body and each including a plurality of heat transfer tubes;

a low-temperature side reheater including a plurality of heat transfer tubes and being mounted in said main body on a downstream side of said high-temperature side superheater;

a low-temperature side superheater including a plurality of heat transfer tubes and being mounted in said main body on a downstream side of said high-temperature reheater;

said plurality of heat transfer tubes of said high-temperature side superheater having tube outer diameters, a number of rows along the longitudinal direction and pitches in both the longitudinal and transverse directions equal to those of

said plurality of heat transfer tubes of said high-temperature side reheater; and

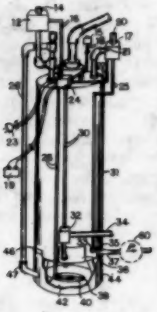
said plurality of heat transfer tubes of said low-temperature side superheater having tube outer diameters, a number of rows along the longitudinal direction and pitches in both the longitudinal and transverse directions equal to those of said plurality of heat transfer tubes of said low-temperature side reheater.

4,944,253

SAFETY SYSTEM FOR HYDRONIC WATER HEATERS AND BOILERS

Richard C. Bellofatto, 4 Lewis Cir., Peabody, Mass. 01960

Filed Oct. 10, 1989, Ser. No. 419,471
Int. Cl.[5] F22B *35/00*
U.S. Cl. 122—504 **15 Claims**



1. An electrical safety system for shutting off all elements of a water heating device, wherein the electrical safety system comprises:

a water heating device having a tank for heating water, a means for heating the water, a water supply means feeding into the tank, a hot water distribution system leading from the tank, an overflow drain connected to the hot water distribution system and a power supply means feeding the means for heating the water;

a water collecting means comprising a water proof sheet of material having a shallow collecting basin on a portion of the sheet, wherein the water collecting means is placed under the tank of the water heating device for collecting any water which leaks from the water heating device;

a water sensing means comprising low power electrical contacts sensitive to water on the sheet within the shallow collecting basin for detecting any water which begins to accumulate within the collecting basin, wherein the electrical contacts are elevated above the sheet to a level which is below the height of the shallow collecting basin;

a normally open valve connected to the water supply means, which normally open valve closes to shut off the supply of water when the water sensing means detects water in the water collecting means;

a means for preventing backflow of hot fluid connected to the hot water distribution system;

a power shut-off means attached to the power supply means and electrically connected to and activated by the water sensing means;

an outflow pipe leading out of the water tank and, connected to the water sensing means, a means for activating an outflow of water out of the tank into the outflow pipe upon detecting water in the water collecting means;

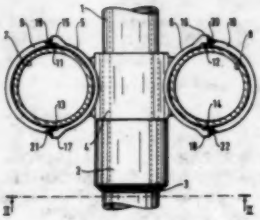
an extension of the overflow drain into the water collecting means.

4,944,254

DEVICE FOR SUSPENDING HORIZONTAL HEAT EXCHANGE TUBES ON A VERTICAL CARRIER TUBE, AND A METHOD OF MANUFACTURING THE DEVICE

Jean Fournier, Rochefort en Yvelines, and Gilbert Deisol, Cernay la Ville, both of France, assignors to Societe Anonyme dite : STEIN INDUSTRIE, Velizy Villacoublay, France

Filed Oct. 18, 1989, Ser. No. 423,280
Claims priority, application France, Oct. 18, 1988, 88 13703
Int. Cl.[5] F22B *37/06, 37/10*
U.S. Cl. 122—511 **3 Claims**



1. A device for suspending horizontal heat exchange tubes (7, 8) on a vertical carrier tube (1),

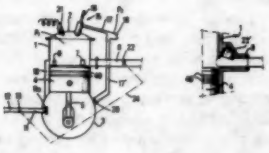
the device being characterized in that it comprises a bottom support sleeve (2) welded at its bottom edge around the support tube, a top support sleeve (4) having its bottom edge resting on the top edge of the bottom support sleeve, said top support sleeve being provided on its sides with two half-shells (5, 6) of radius of curvature slightly greater than that of the horizontal tubes, and add-on half-shells (9, 10) of radius of curvature slightly greater than that of the horizontal tubes, welded edge-to-edge (19, 21; 20, 22) to the half-shells fixed to the top sleeve, thereby forming collars which clamp the horizontal heat exchange tubes on either side of the vertical carrier tubes.

4,944,255

TWO-STROKE ENGINE WITH PNEUMATIC INJECTION AND FLOWRATE RESTRICTION AT THE EXHAUST

Pierre Duret, Paris, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Oct. 6, 1988, Ser. No. 254,266
Claims priority, application France, Oct. 7, 1987, 87 13837
Int. Cl.[5] F02B *33/04*
U.S. Cl. 123—65 EM **15 Claims**



1. Two-stroke engine having at least one cylinder in which a piston moves, a crank case communicating with one end of

the at least one cylinder and having means for admitting air into the crank case, at least one pipe means for admitting unmixed air from the crank case to a cylinder transfer port, means for pneumatically injecting fuel into the at least one cylinder comprising pneumatic injector means, means for supplying and metering fuel to said pneumatic injector means, and pipe means connected to the crank case by a valve means and forming a volume of pressurized air connected to the pneumatic injector means for supplying the pneumatic injector means with pressurized air for atomizing the fuel, an exhaust pipe means connected to the at least one cylinder by an exhaust port located in a position offset in a direction of travel of the piston with respect to the cylinder transfer port, and at least one restricting means disposed inside the exhaust pipe means for restricting a passage of exhaust gases, said restricting means being controlled and adjusted so as to be opened and closed as a function of at least one engine operating parameter.

4,944,256

ROCKER ARM ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE POPPET VALVES AND THE LIKE

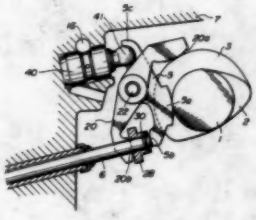
Yutaka Matayoshi, Yokosuka; Yasuhiko Nakagawa, Kamakura; Kyugo Hamai, Yokosuka, and Shigeru Kamegaya, Tokyo, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 15, 1989, Ser. No. 394,091

Claims priority, application Japan, Aug. 16, 1988, 63-203521; Aug. 16, 1988, 63-203522; Aug. 16, 1988, 63-107763[U]

Int. Cl.[5] F01L *1/30, 1/18*

U.S. Cl. 123—90.24 **10 Claims**



1. In an internal combustion engine having a cylinder head, a valve reciprocally disposed therein and a cam shaft on which first and second cams are disposed, a rocker arm arrangement comprising:

a first rocker arm, said first rocker arm being pivotally mounted at a first end on a member which is supported on said cylinder head, said first rocker arm being arranged to engage the stem of said valve at a second end thereof and to have a first cam follower formed between said first and second ends, said first cam follower being arranged to engage the first cam of said cam shaft; and

a second rocker arm, said second rocker arm being pivotally mounted on said first rocker arm, said second rocker arm having a second cam follower at a first end thereof and a portion which engages an engagement member which is provided on the top of said valve stem at a second end thereof, said second cam follower being arranged to engage the second cam formed on said cam shaft.

4,944,257

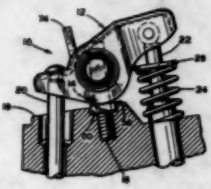
COLD-FORMED ROCKER ARM WITH BEARING FLANGES AND SPLASH PLATE

Jesse V. Mills, Toledo, Ohio, assignor to Henley Manufacturing Holding Company, Inc., Hampton, N.H.

Filed Sep. 27, 1989, Ser. No. 413,229

Int. Cl.[5] F01L *1/18*

U.S. Cl. 123—90.34 **19 Claims**



1. A cold-formed rocker arm comprising a one-piece metal body of generally inverted U-shaped cross section throughout most of its length, said body having a top wall and two generally parallel side walls extending downwardly therefrom and being structurally integral therewith, said side walls having annular flanges extending outwardly therefrom and forming aligned bores to receive bearings, said body having means at one end to engage an end of a push rod, and said body having means at the other end to engage an end of a valve stem.

4,944,258

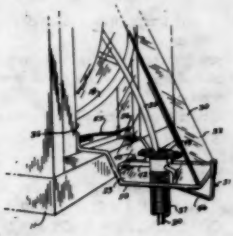
OPERATOR PROTECTION FOR HIGH PRESSURE HOSE MACHINES

Robert D. Knutson, Oconomowoc; Bruce Boczkiewicz, Mukwonago, and James C. Wurster, Pewaukee, all of Wis., assignors to Super Products Corporation, New Berlin, Wis.

Filed Apr. 17, 1989, Ser. No. 340,899

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—167 C **14 Claims**



1. In a sewer and/or catch basin cleaner of the type including a water injection system comprising a high pressure water hose, reel means supporting said hose and arranged to permit the hose to extend into and be withdrawn from a sewer catch basin or manhole, means for delivering water under pressure through said hose and means for protecting an operator from water hose or hose coupling failure, said protecting means including:

a first hood-like shield portion at least partially surrounding an upper exposed section of the water hose adjacent said hose reel;

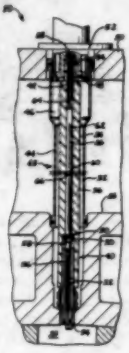
a second elongate tubular portion for enclosing said water hose extending between said shield portion and said sewer catch basin or manhole and having a free end extending toward and communicating with the opening of the catch basin or manhole, the combined length of said first and second portions providing head-to-toe protection of the operator in case of hose or hose coupling rupture.

4,944,259

ENGINE IGNITION SYSTEM WITH AN INSULATED AND EXTENDABLE EXTENDER

Ronald D. Richardson, Pekin, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 5, 1988, Ser. No. 280,472
Int. Cl.[5] F02P 15/00
U.S. Cl. 123—169 P A 9 Claims



1. A spark plug extender for use in a spark ignited engine for conducting an electrical charge from an energy source to a spark plug, comprising:

a tubular insulating member fixedly attached to and surrounding at least a portion of an electrically conductive core;

said core having a first end for receiving said electrical charge and a second end for transmitting said electrical charge, said core being at least 6 millimeters in diameter and at least 7.5 centimeters long with at least 3.6 centimeters of said core being on each side of the longitudinal midpoint of said extender;

a first terminal for receiving said electrical charge from said energy source and transmitting said charge to said first end of said core; and

a second terminal for receiving said electrical charge from said second end of said core and transmitting said charge to said spark plug;

one of said terminals being axially moveable with respect to said core.

4,944,260

AIR INTAKE HEATER SYSTEM FOR INTERNAL COMBUSTION ENGINES

Patrick R. Shea, Columbus, Ind., and Robert T. Niemczyk, Montgomery, Ala., assignors to Cummins Electronics, Inc., Columbus, Ind.

Filed Jun. 5, 1989, Ser. No. 361,380
Int. Cl.[5] F02M 31/02
U.S. Cl. 123—179 H 17 Claims

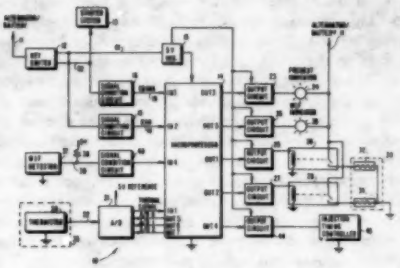
1. An air intake heater system for use with an internal combustion engine having a battery and corresponding charging system, said air intake heater system comprising:

(a) electrical air intake heater means for heating intake manifold air;

(b) temperature monitoring means for monitoring intake manifold air temperature, said temperature monitoring means producing a temperature signal corresponding to intake manifold air temperature;

(c) first circuit means responsive to said temperature signal and producing a first signal of variable duration based upon said temperature signal;

(d) second circuit means responsive to said temperature signal and producing a second signal of variable duration based upon said temperature signal when said battery voltage exceeds a predetermined limit; and



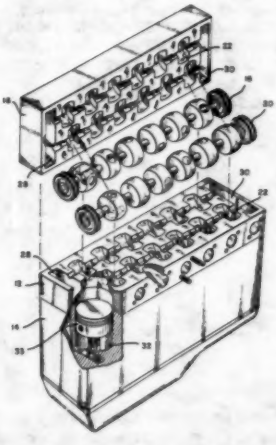
(e) third circuit means responsive to said first and said second signals, said third circuit means supplying a power signal from said battery to said electrical air intake heater means in response to said first and second signals.

4,944,261

SPHERICAL ROTARY VALVE ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

George J. Coates, 2500 Belmar Blvd., Wall Township, Monmouth County, N.J. 07719

Filed Oct. 16, 1989, Ser. No. 422,053
Int. Cl.[5] F01L 7/10
U.S. Cl. 123—190 D 18 Claims



1. An improved rotary valve assembly for use in internal combustion engines of the piston and cylinder type, said spherical rotary valve assembly comprising:

a removable two-piece cylinder head securable to the internal combustion engine, said two-piece removable cylinder head comprising an upper and lower cylinder head section, said upper and lower cylinder head sections when secured to said internal combustion engine define two cavites radially aligned with the cylinders of said internal combustion engine, said cavities defining a plurality of first drum accommodating cavities for receipt of radially aligned rotary intake valves, said second cavity defining a plurality of second drum accommodating cavities for receipt of a plurality of radially aligned rotary exhaust valves, said lower cylinder head section and said plurality of first drum accommodating cavities having an inlet port

in communication with said cylinder, said lower cylinder head section and said second drum accommodating cavities having an outlet port in communication with said cylinder;

a sealing means associated with said inlet and said outlet port;

a first passageway for the introduction of a fuel/ air mixture into said cylinder head by way of said first drum accommodating cavity and said rotary intake valve and a second passageway for the evacuation of exhaust gases from said cylinder by way of said second drum accommodating cavity and said rotary exhaust valve;

a first shaft means journaled on bearing surfaces within said first cavity radially aligned with said cylinders of said internal combustion engine, said first shaft means having mounted thereon, said rotary intake valves;

a second shaft means journaled on bearing surfaces within said second radially aligned cavity, said second shaft means having positioned thereon, a plurality of said rotary exhaust valves;

said rotary intake valve and said rotary exhaust valve each having a spherical section defined by two parallel planes of a sphere, said planes being disposed symmetrically about the center of said sphere, defining a spherical periphery and planer end walls, said rotary intake valves mounted on said first shaft means in said plurality of drum accommodating cavities in gas tight sealing contact with said inlet port, each of said rotary exhaust valves mounted on said second shaft means in said plurality of drum accommodating cavities in gas tight sealing contact with said inlet port and said outlet port, respectively, said rotary intake valve having a plurality of passageways therethrough for the introduction and interruption of fuel/air mixture to said engine and said rotary exhaust valve having a plurality of passageways therethrough for the evacuation and interruption of evacuation of said exhaust gases from said engine, wherein said shaft means and said rotary intake valve and rotary exhaust valve are rotated at a speed relative to said operating cycle of said engine relative to the number of passageways through said rotary intake valve and said rotary exhaust valves.

4,944,262

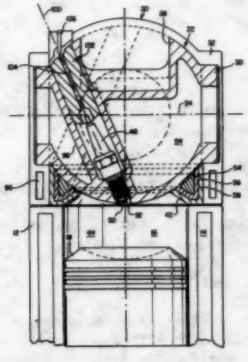
ROTATIVE COMBUSTION CHAMBER ENGINE

Richard W. Molina, Dallas, Tex.; Manuel Cortina, Mexico City, Mexico; Roberto Bertolina, Naucalpan, Mexico, and Luis H. Baisa, Cuautitlan, Mexico, assignors to INASA Automotive, Inc., Dallas, Tex.

Filed Apr. 5, 1989, Ser. No. 333,316

Int. Cl.[5] F01L *7/00*

U.S. Cl. 123—190 BD **16 Claims**



1. An improved combustion chamber assembly for an internal combustion engine having a block defining a cylinder open at a first end and piston moveable in the cylinder, comprising:

a head for mounting on the block and defining an inlet passage and an exhaust passage;

a rotating element having a generally spherical outer surface mounted in said head for rotation about a first axis, a depression formed into the outer surface to define an arcuate notch;

an annular seal assembly having an annular seal ring forming a circular seal with the outer surface of the rotating element, the annular seal ring lying in a seal plane generally parallel the first axis, the block, seal assembly, rotating element and piston defining a combustion chamber;

rotation of the rotating element about the first axis in a first rotational direction sequentially connecting the inlet passage and combustion chamber through the notch to charge the combustion chamber with a combustible mixture, sealing the combustion chamber for compression of the combustible mixture and combustion of the mixture, and connecting the exhaust passage to the combustion chamber to exhaust the combusted gases, the annular seal ring rotating about a second axis perpendicular the seal plane as the rotating element rotates to equalize wear between the seal and rotating element.

4,944,263

CYLINDER HEAD OF DOHC ENGINE

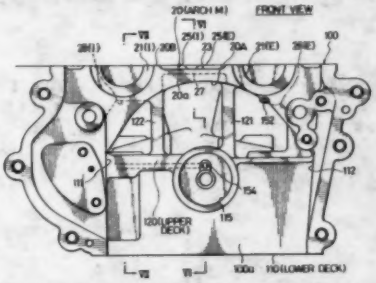
Seishi Nagano; Masayuki Hashimoto, both of Kanagawa, and Akira Murasaki, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nissan Kohki Co., Ltd., Kanagawa, both of, Japan

Filed Nov. 15, 1989, Ser. No. 436,654

Claims priority, application Japan, Nov. 16, 1988, 63-149498[U]

Int. Cl.[5] F02F *1/00*

U.S. Cl. 123—193 H **7 Claims**



1. A cylinder head of a DOHC engine including two camshafts mounted on a cylinder head, wherein an arch member is formed integral with the cylinder head on a front camshaft driving side to support the two camshafts in such a way that an inner arcuate surface of said arch member extends to both inner side walls of the cylinder head.

4,944,264

CHAIN CASING FOR ENGINE

Akira Murasaki, Yokohama, and Masayuki Hashimoto, Kanagawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nissan Kohki Co., Ltd., Kanagawa, both of, Japan

Filed Nov. 9, 1989, Ser. No. 433,894

Claims priority, application Japan, Nov. 15, 1988, 63-148722[U]

Int. Cl.[5] F02F *7/00*

U.S. Cl. 123—195 C **3 Claims**

1. A chain casing for an engine having at least one camshaft

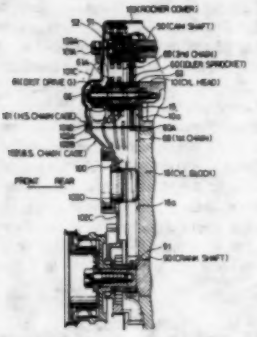
mounted on a cylinder head and a crankshaft attached to a cylinder block, comprising:

(a) at least one camshaft sprocket coaxially coupled to the at least one camshaft;

(b) an idler sprocket rotatably supported between the camshaft and the crankshaft and on the cylinder block;

(c) a first chain reeved around the crankshaft and said idler sprocket to rotate said idler sprocket by the crankshaft;

(d) a second chain reeved around said idler sprocket and said



camshaft sprocket to rotate said camshaft sprocket by said idler sprocket; and

(e) a chain casing fixed to an end of the cylinder head and the cylinder block enclosing said idler sprocket, first and second chains, said chain casing being formed with contiguous inner wall surfaces extending from approximate said at least one camshaft to approximate said crankshaft along which lubricant can smoothly flow downward on the basis of gravity without being accumulated midway therealong.

4,944,265

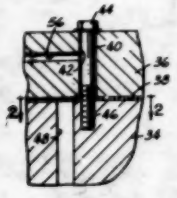
OIL RESTRICTING HEAD GASKET CONSTRUCTION

Mark A. Davey, St. Clair Shores, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 24, 1989, Ser. No. 383,504

Int. Cl.[5] F01M *1/00*

U.S. Cl. 123—196 R **4 Claims**



1. In an internal combustion engine having an engine block and an overlying cylinder head attached to the block, an improved restricted oil supply for valve components supported by the cylinder head, comprising: an oil passage in the engine block extending to the cylinder head; another oil passage in the cylinder head extending to the engine block; the axes of the passages being laterally offset from one another sufficiently so that there is not a direct axial connection therebetween; a gasket extending between the engine block and the cylinder head, the gasket having openings therethrough corresponding to the passages in the block and the cylinder head respectively; the gasket defining an oil flow restrictive channel between the openings therein and between the block and cylinder head for limiting the flow of lubricating oil from the block to the cylinder head.

4,944,266

DIRECT-INJECTION DIESEL ENGINE

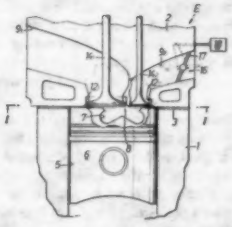
Shumpei Hasegawa; Yasushi Takahashi, and Yoshifumi Mishima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 310,293

Claims priority, application Japan, Feb. 12, 1988, 63-31097

Int. Cl.[5] F02B *15/00*

U.S. Cl. 123—302 **2 Claims**



1. A direct-injection diesel engine comprising a cylinder block having a plurality of cylinders in which a piston is slidably received in each cylinder, a cylinder head connected to an upper surface of the cylinder block, a plurality of fuel injector nozzles mounted in the cylinder head with at least one said nozzle to directly inject a fuel into a combustion chamber defined between each said piston and the cylinder head,, first and second independent intake ports provided in the cylinder head for introducing an intake gas into each said combustion chamber, a single exhaust port provided in the cylinder head for each combustion chamber, an intake controller mounted in each second intake port for bringing the second intake port into a controlled state in a region of low speed operation of the engine and into a normal state in a region of high speed operation of the engine, wherein each of said first and second intake ports are formed helically in the same direction to produce swirls in the same direction in intake gases introduced respectively through the intake ports into each combustion chamber and wherein downstream openings of the first and second intake ports are disposed in locations of substantially point symmetry with respect to the fuel injector nozzle position in each combustion chamber whereby a swirl in the intake gases is produced in both low and high speed operation of the engine, and a downstream opening of the exhaust port disposed adjacent one of the first and second intake ports in each combustion chamber in a direction of arrangement of the plurality of cylinders.

4,944,267

ELECTROPNEUMATIC DISPLACEMENT DEVICE FOR A THROTTLE VALVE OF AN INTERNAL COMBUSTION ENGINE

Arnold Mann, Bieber, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 411,306

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1988, 3840465

Int. Cl.[5] F02D *9/02*; F02M *3/07*; F15B *15/10*

U.S. Cl. 123—339 **10 Claims**

1. A system including an electropneumatic displacement device connected to a throttle valve of an internal combustion engine in idling condition, the displacement device comprising

a housing having a chamber;

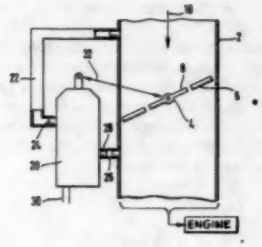
a diaphragm disposed in the chamber in the housing, the

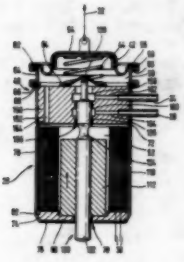
diaphragm forming an outer wall of the chamber and of the housing and being operatively connected to the throttle valve;

a spring in the chamber, the spring having a first end and a second end opposite the first end, the first spring end acting against the diaphragm;

a connection on the housing for atmospheric pressure, a magnet coil in the housing;

an armature which is axially displaceable in the magnet coil in response to electric current in the coil; and





a valve body firmly attached to the armature, the valve body holding said connection for atmospheric pressure open or closed corresponding to a position of the valve body; and

wherein the displacement device further comprises a connection on the housing for vacuum;

said connections for vacuum and atmospheric pressure are alternately kept open by the valve body;

the valve body is acted on by the second end of the spring; and

the coil current in the magnet coil serves as a control variable for positioning the throttle valve.

4,944,268

APPARATUS FOR VARYING THE POSITION OF A CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Werner Wilde, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

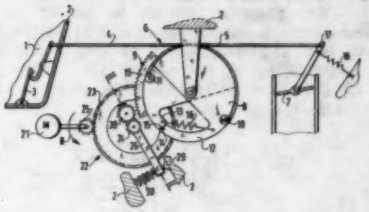
Filed Sep. 13, 1989, Ser. No. 406,934

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1988, 3838915

Int. Cl.[5] F02D *11/10*

U.S. Cl. 123—342 **29 Claims**

1. An apparatus for varying the position of a fuel control device (7, 107) that controls the output of an internal combustion engine which comprises an operating element (3, 103) which manually operates a transmission device (6, 106), in which a control motor (21, 126) can be operatively connected via a gear assembly (22, 127) with a first rotary element (9, 109) connected to the fuel control device (7, 107), said first rotary elemen. is rotatably supported relative to a coaxial second rotary element (8, 108) operatively connected to the operating element (3, 103), wherein said two rotary elements (9, 8 or 109, 108) are prestressed by a spring (16, 116), forcing arms thereon to contact one another at stops (14, 15, 114, 115) disposed facing one another, said assembly gear (22, 127) has at least one



drive wheel (20, 124, 125) operatively connected to the control motor (21, 126), which drive wheel can be shifted from a position of repose, in which an operative connection with the first rotary element (9, 109) is interrupted, into a working position, in which the operative connection with the first rotary element (9, 109) is established.

4,944,269

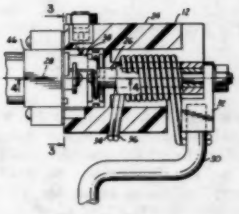
ACCELERATING PEDAL FOR ELECTRONIC THROTTLE ACTUATION SYSTEM

William J. Imoehl, Williamsburg, Va., assignor to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Sep. 18, 1989, Ser. No. 408,636

Int. Cl.[5] F02D *41/00, 11/10*

U.S. Cl. 123—399 **12 Claims**



1. In an accelerator pedal control apparatus that remotely controls the throttle valve of an internal combustion engine via electrical signals wherein the apparatus comprises a housing, a shaft journaled on the housing, for imparting rotational motion to the shaft, a spring rotationally biasing the shaft toward a first position corresponding to the throttle valve being in closed or substantially closed position, an electrical sensor that is operated by the rotation of said shaft to positions away from said first position to signal the amount of rotation that is being imparted to the shaft, and a friction mechanism that acts on the shaft to dampen shaft rotation, the improvement in said friction mechanism characterized by a disk affixed to said shaft, friction elements on opposite sides of said disk, a pair of formed metal elements acting to sandwich said friction elements and said disk, and resilient means urging said formed metal elements to forcefully sandwich said friction elements and said disk.

4,944,270

ASYMMETRICAL EXCITATION TYPE MAGNETIC DEVICE AND METHOD OF MANUFACTURE THEREOF

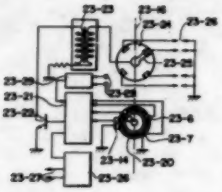
Akira Matsushita, 12-5, Miyazaki 1-Chome, Miyamae-Ku, Kawasaki-Shi, Kanagawa-Ken, and Susumu Abe, 9-204, Nishi-Kandaiji Danchi, 3-5 Kandaiji, Kanagawa-Ku, Yokohama-Shi, Kanagawa-Ken, both of Japan

Filed Mar. 31, 1988, Ser. No. 158,787

Claims priority, application Japan, Mar. 31, 1987, 62-75978; Aug. 17, 1987, 62-203840; Sep. 21, 1987, 62-236744; Sep. 21, 1987, 62-236745; Sep. 21, 1987, 62-236746

Int. Cl.[5] **F02P** *7/067;* **H01F** *1/00;* **H03K** *3/45;* **G11C** *11/02*

U.S. Cl. 123—414 **26 Claims**



1. An asymmetric excitation type magnetic device having a composite magnetic body and a detecting coil, said composite magnetic body being composed of a plurality of ferromagnetic molecules which are different in composition and coercivity with respect to each other and which are combined so as to have magnetic anisotropy oriented in the same direction, wherein external positive and negative asymmetric magnetic fields are applied to said composite magnetic body in the order: that first an auxiliary magnetic field is applied thereto so as to orient the direction of magnetization to a negative direction of only those ferromagnetic molecules in said composite magnetic body having a relatively small coercivity, and then next a main magnetic field is applied thereto to reverse the direction of magnetization of said ferromagnetic molecules having a relatively small coercivity to a positive direction being the same as the direction of magnetization of ferromagnetic molecules in said composite magnetic body having a relatively strong coercivity, thereby to produce variations in magnetic flux in said composite magnetic body due to rapid flux reversal therein for thereby resultantly generating pulse outputs across said detecting coil in response to said variations in magnetic flux.

4,944,271

CONTROLLER FOR INTERNAL COMBUSTION ENGINE

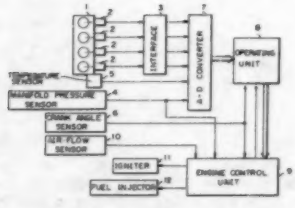
Toshio Iwata, and Satoru Ohkubo, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1989, Ser. No. 334,505

Claims priority, application Japan, Apr. 13, 1988, 63-92165

Int. Cl.[5] **F02M** *51/00*

U.S. Cl. 123—435 **6 Claims**



1. In a controller for an internal combustion engine operating on the basis of drive control parameters comprising:

pressure sensing means, having a variable transducing modulus and pressure offset between an actual pressure and a detected pressure in the cylinders of the engine, for detecting pressure in the cylinders of the engine and for generating an output representing a detected pressure profile;

calibrating means comprising (i) means for generating a renewed modulus and a renewed offset of said pressure sensing means, (ii) means for calibrating the output from said pressure sensing means on the basis of said renewed modulus and renewed offset of said pressure sensing means to produce a calibrated pressure profile in the cylinders, and (iii) means for determining the combustion parameters of the engine on the basis of said calibrated pressure profile; and

control means responsive to said calibrating means comprising means for determining the drive control parameters of the engine on the basis of said combustion parameters, and means for controlling combustion of the engine normally on the basis of said drive control parameters but, in predetermined operating conditions of the engine, on the basis of predetermined parameters.

4,944,272

CARBURETOR ARRANGEMENT

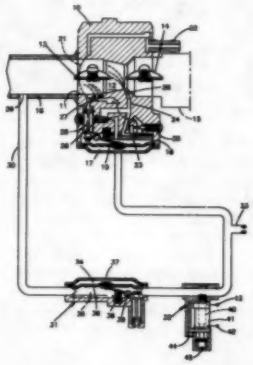
Bo P. I. Carlsson, Lerum, and Ulf M. Svensson, Trollhättan, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Nov. 10, 1988, Ser. No. 269,460

Claims priority, application Sweden, Nov. 23, 1987, 8704628

Int. Cl.[5] **F02D** *1/06*

U.S. Cl. 123—438 **8 Claims**



1. A carburetor arrangement provided with a carburetor housing having a flow channel (11) where a throttle (13) and a venturi tube (12) are disposed as well as a fuel chamber (18) from which there is a connection to at least one nozzle located in the flow channel, and an air chamber (17) located beside the fuel chamber with connection to a reference pressure source, wherein the said reference pressure source comprises a pressure output (29) in the flow channel (11) or in the extension thereof (16) and a pressure regulator (31) connected to said output with a separate component (32) for an on/off control function in respect of the said reference pressure up to the connection to the air chamber and that the said separate component (32) for the on/off function is attached to a variable feed arrangement with which the mixture ratio of the carburetor is controlled in compliance with a characteristic provided by the feed arrangement, and wherein there is an opening (33) to the surrounding between the component for the on/off function and the air chamber.

4,944,273

ZEOLITES AS SPECIFIC ADSORBENTS FOR NO_X AND CO

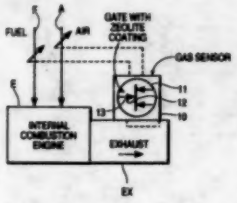
Detlef Baresel, Stuttgart, and Peter Scharner, Leonberg Gebersheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 313,621

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805734

Int. Cl.[5] F02D 41/14; G01N 27/417

U.S. Cl. 123—440 18 Claims



16. In an internal combustion engine fuel supply control means of the type having a sensor means to generate a signal in proportion to levels of nitrogen oxides or carbon monoxide in exhaust gases from said engine and being operable to control the fuel/air ratio being introduced into the engine for combustion, the improvement wherein said sensor means comprises a sensor specific for a nitrogen oxide or carbon monoxide comprising a semiconductor having a control element; and a zeolite rich in silicic acid with an Si:Al ratio of 1:1 to 100:1, and which is a specific adsorbent for the nitrogen oxide or the carbon monoxide coated on said control element to influence the electrical characteristics of said semiconductor in proportion to the amount of the nitrogen oxide or carbon monoxide adsorbed by said zeolite and wherein

said semiconductor is an FET transistor and said zeolite is coated on its gate.

4,944,274

AIR-FUEL RATIO CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Takayuki Itsuji, Novi, Mich.; Sadayasu Ueno, Katsuta, and Norio Ichikawa, Mito, both of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Automotive Engineering Co., Ibaraki, both of, Japan

Filed Oct. 4, 1989, Ser. No. 417,075

Claims priority, application Japan, Oct. 11, 1988, 63-253774

Int. Cl.[5] F02M 51/00

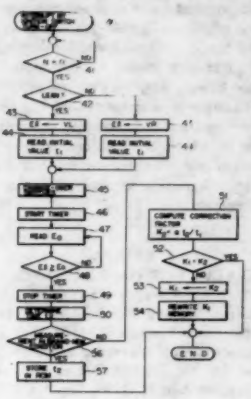
U.S. Cl. 123—489 8 Claims

1. An air-fuel ratio control apparatus for an internal combustion engine comprising:

a solid electrolyte having a first electrode arranged on one surface thereof to contact with the atmosphere and a second electrode arranged on the other surface thereof to contact with an exhaust gas from said engine through a diffusing resistor;

means for applying a voltage across said first and second electrodes to detect an oxygen pump current flowing through said solid electrolyte;

means for computing a correction factor relating to a change in a diffusion coefficient of said diffusing resistor; and



means for determining an air-fuel ratio of said exhaust gas in accordance with said correction factor and the oxygen pump current detected by said detecting means.

4,944,275

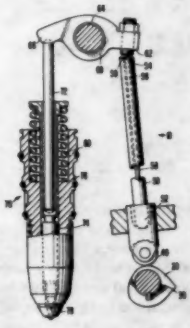
FUEL INJECTOR TRAIN WITH VARIABLE INJECTION RATE

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jul. 10, 1989, Ser. No. 377,319

Int. Cl.[5] F02M 39/00

U.S. Cl. 123—501 19 Claims



1. A fuel injection train for injecting fuel at a reduced rate during a portion of a fuel injection cycle comprising:

a fuel injector having a plunger and plunger biasing means having a predetermined spring rate for biasing the plunger to control the injection rate of the injector,

a rocker arm for applying force to said plunger in response to force applied thereto,

cam assembly means,

and an elongate push rod means mounted between said cam assembly means and said rocker means, said cam assembly means operating to apply force to said push rod means to cause said push rod means to apply force to said rocker arm,

said push rod means including a first end in contact with said rocker arm, a second end in contact with said cam assem-

bly means, and push rod biasing means between said first and second ends, said push rod means operating in response to an axial force applied thereto which is in excess of a predetermined force to allow movement of said first and second ends for a limited distance toward one another against the bias of said push rod biasing means,

said push rod biasing means further including means for varying the bias thereby varying the predetermined force required to cause movement of said first and second ends toward one another and changing the point in the injection cycle at which the first and second ends begin to move toward one another, thereby varying the point in the field injection cycle in which the injector injects fuel at a reduced rate.

4,944,276

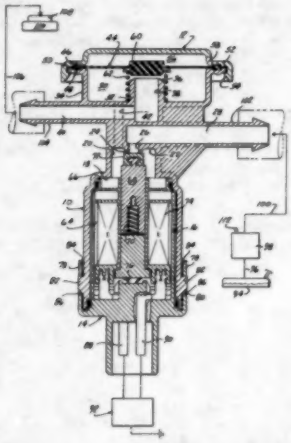
PURGE VALVE FOR ON BOARD FUEL VAPOR RECOVERY SYSTEMS

William J. House, Sterling Heights, Mich.; Loren H. Kline, Oregon, Ohio, and Lawrence McAuliffe, Jr., Southfield, Mich., assignors to Colt Industries Inc, New York, N.Y.

Continuation of Ser. No. 109,044, Oct. 6, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 209,511

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—520 **10 Claims**



1. A purge valve for controlling the flow of vapor from a vapor source to a vacuum source, said valve comprising an elongate generally tubular main housing having a first chamber opening at one axial end of said housing and a second chamber opening at the opposite axial end of said housing, means defining an inlet passage adapted to be connected to a vapor source extending into said housing and an outlet passage adapted to be connected to a vacuum source extending into said housing, means defining a first axial passage extending from said inlet passage to an opening at the inner end of said first chamber, means defining a second axial passage extending from an outlet opening in said second chamber to said outlet passage, means defining a third passage placing said first and second chambers in constant communication with each other, first and second end cap means sealingly mounted at the opposite ends of said main housing to respectively seal said first and second chambers from atmopshere, first solenoid controlled valve means in said housing operable to selectively block or accommodate flow from said first axial passage into said first chamber, and second pressure responsive valve means operable to selectively block or accommodate flow from said second chamber into said second axial passage in response to variations in pressure in said outlet passage.

4,944,277

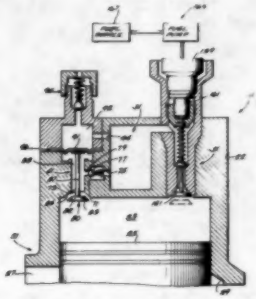
CYLINDER ENTRAPMENT SYSTEM WITH AN AIR SPRING

Jeffrey A. Olson, Mundelein, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 3, 1989, Ser. No. 318,708

Int. Cl.[5] F02M *67/04*

U.S. Cl. 123—532 **14 Claims**



1. An internal combustion engine comprising a cylinder, a piston reciprocal in said cylinder, an accumulation chamber, a supply conduit including a check valve and extending between said cylinder and said accumulation chamber, a supply valve having a valve head located between said cylinder and said check valve and operable between an open position and a closed position to control gas flow from said cylinder through said supply conduit to said accumulation chamber, and means responsive to the pressure in said cylinder and responsive to the pressure in said accumulation chamber acting in by-passing relation to said check valve for selectively moving said supply valve relative to said open position and said closed position.

4,944,278

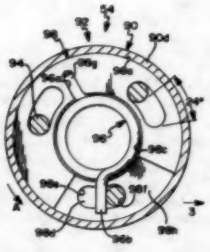
TORSION DAMPING MECHANISM FOR A SUPERCHARGER

Steven W. Woodard, Milford, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 14, 1989, Ser. No. 339,333

Int. Cl.[5] F02B *33/38*

U.S. Cl. 123—559.1 **16 Claims**



1. A torsion damping mechanism adapted to be rotatably interposed between first drive means rotatably driven in one direction by positive torque from a periodic combustion engine and a second drive means for driving a first gear in constant mesh with a second gear; characterized by:

annular means disposed for rotation about an axis and fixed to one of the drive means, the annular means including an annular member formed of elastomeric material having a hardness in the range of 50–80 shore D durometer and an outer shell banded about the annular member and formed

of rigid material relative to the annular member, the annular member including a plurality of circumferentially spaced apart and generally arcuate-shaped slots each having first and second ends respectively defining stops in the one direction and in the opposite direction of rotation;

axially extending pins each having one end loosely received by one of the slots and the other end fixed to the other drive means; and

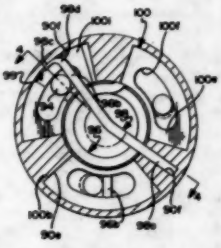
spring means for flexibly transmitting positive torque between the drive means and operative in a static state of the mechanism to position the pins closer to the second stops than the first stop.

4,944,279

SUPERCHARGER TORSION DAMPING MECHANISM WITH FRICTION DAMPING

Steven W. Woodard, Milford, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 14, 1989, Ser. No. 339,336
Int. Cl.[5] F02B *33/38*
U.S. Cl. 123—559.1 **14 Claims**



1. A torsion damping mechanism adapted to be rotatably interposed between first drive means rotatably driven in one direction by positive torque from a periodic combustion engine and a second drive means for driving a first gear in constant mesh with a second gear; the mechanism characterized by:

first and second spring means respectively operative to flexibly transmit the positive torque and a negative torque between the drives; and

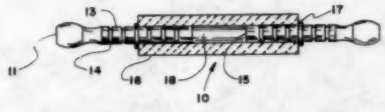
friction damper means operative only in response to negative torque flexing the second spring means.

4,944,280

SEPARATED CIRCUIT HOT SPARK PRODUCING APPARATUS

Carroll M. Washington, 3900 E. Chatham Dr., Richmond, Va. 23222

Filed Jun. 28, 1989, Ser. No. 372,602
Int. Cl.[5] F02P *15/00*
U.S. Cl. 123—627 **20 Claims**



1. An apparatus to introduce an adjustable auxiliary gap in the electrical path between the spark source and spark plug of an internal combustion engine comprising:

a non-conducting cylindrical housing having two ends longitudinally disposed along the length of said non-conducting cylindrical housing,

said non-conducting cylindrical housing having an exterior and an interior surface,

two electrodes comprised of a conductive material,

said electrodes being substantially cylindrical in shape,

said electrodes having two ends defining length of said electrode,

the first of said ends of said electrode being a planar end surface,

the second of said ends of said electrode being substantially spherical in shape allowing for the removable attachment to a spark plug wire,

said planar end surface of each of said electrodes being inserted into the interior of said non-conducting cylindrical housing,

said planar end surfaces of each of said electrodes being displaced next to one another without contacting one another within said interior of said non-conducting cylindrical housing,

said electrodes having adjustment means,

said adjustment means being grooves, and

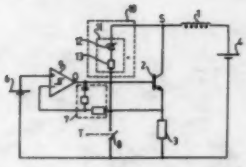
said grooves being displaced at regular intervals along the length of said electrodes.

4,944,281

CIRCUIT FOR REGULATING CURRENT IN AN INDUCTIVE LOAD

Michel Suquet, Cugnaux, France, assignor to Bendix Electronics S.A., Toulouse, France

Filed Nov. 13, 1987, Ser. No. 120,572
Claims priority, application France, Nov. 26, 1986, 86 16500
Int. Cl.[5] F02P *3/05*; H01H *47/32*
U.S. Cl. 123—644 **7 Claims**



1. Circuit for the regulation of the current flowing in an inductive load fed by a voltage source, comprising:

an electronic control device having a control electrode and input and output electrodes placed in series with the load;

a comparator having a first signal representing a reference current value connected to one input and a second signal representing the instantaneous value of the current flowing in the load and in said electronic control value connected to a second input and its output connected to said control electrode;

said comparator has a hysteresis type transfer characteristic, wherein the thresholds $-H/2$ and $+H/2$ define the transitions of the electronic control device to the cut-off state or to the saturation conducting state, to oscillate the current in the load between two values that are closely above and closely below the nominal current to be established in the load; and

a feedback loop operatively connected between a terminal common to the load and to said device, and said control electrode, said feedback loop coacting with said comparator, for controlling a proportional conduction of said device when the voltage at said common terminal reaches a predetermined threshold for oscillating the current in the load about a nominal value and a loop stability corrector network.

4. Circuit for the regulation of the current flowing in an ignition coil fed by a voltage source, comprising:

an electronic control device having a control electrode and input and output electrodes placed in series with the ignition coil;

a comparator having a first signal representing a reference current value connected to one input and a second signal representing the instantaneous value of the current flow-

ing in the ignition coil and in said electronic control device connected to a second input and its output connected to said control electrode; and

a feedback loop operatively connected between a terminal common to the ignition coil and to said device, and said control electrode, said feedback loop comprising a reversed biased Zener diode in series with a resistor, coacting with said comparator, for controlling a proportional conduction of said device when the voltage at said common terminal reaches a predetermined threshold for oscillating the current in the ignition coil about a nominal value and a loop stability corrector network.

4,944,282

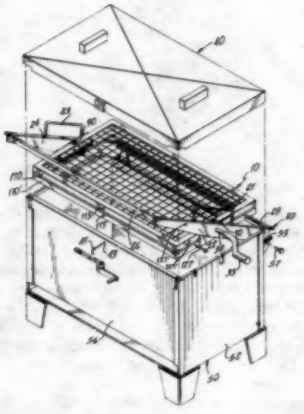
GRILL APPARATUS

Ocasio F. Aguiar; Facundo T. Rodriguez, and Raul Fuentes, all of 110 E. 49th St., Hialeah, Fla. 33013

Continuation-in-part of Ser. No. 350,090, May 10, 1989. This application Dec. 22, 1989, Ser. No. 455,114

Int. Cl.[5] F24B *3/00*

U.S. Cl. 126—25 R **6 Claims**



1. A grill apparatus for cooking foodstuff mounted over a heat source in an oven that includes opening on its upper end and a cover and said oven having rear, front and side ends, comprising:

A. support frame means pivotally mounted to the rear of said oven and over said opening further including lateral sides that have outwardly extending flanges that come in contact with the adjacent side ends of said oven thereby resting thereon when in horizontal position; and

B. two grill assemblies having fastening means urging them toward each other and said grill assemblies being rotably mounted within said support frame means so that said foodstuff is sandwiched between said two grill assemblies and can be readily exposed to said heat source on both sides and said grill assemblies include steel wire means disposed in criss-crossed fashion with sufficiently small separation to hold the foodstuff top be cooked in place and wherein said grill assemblies include means for providing rotational movement from outside the oven to said grill assemblies.

4,944,283

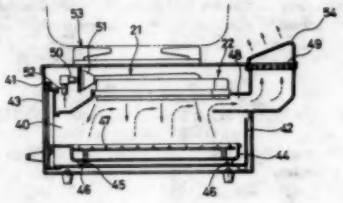
GAS BURNER

Mitsuo Tsuchiya, Nagoya; Masafumi Matsubara, Owariasahi; Yoshihiro Mori, Kuwana, and Hideo Itami, Nagoya, all of Japan, assignors to Paloma Kogyo Kabushiki Kaisha and Toho Gas Co., Ltd., both of Nagoya, Japan

Filed Aug. 29, 1989, Ser. No. 399,899

Int. Cl.[5] A47J *37/00*; **F24C** *3/00*

U.S. Cl. 126—41 R **4 Claims**



1. A gas burner comprising

a main burner for cooking food,

a catalyzer for absorbing smoke, odor and other gases contained in combustion exhaust gas,

an after burner positioned at a lower level than the catalyzer and located in a position upstream of the catalyzer for activating the catalyzer to burn out smoke, odor and other gases contained in the combustion exhaust gas, and

a fire guide, said main burner, after burner and fire guide being formed as an integral unit, said main burner and said after burner each having a porous flame plate through which gas passes to form a combustion area, and wherein the fire guide is formed on a boundary between the porous flame plate of said main burner and the porous flame plate of said after burner.

4,944,284

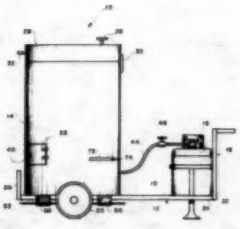
PORTABLE STOVE

Vorney O'Quin, P.O. Box 215, Galliano, La. 70354

Filed Sep. 5, 1989, Ser. No. 402,773

Int. Cl.[5] F23C *11/00*

U.S. Cl. 126—41 R **19 Claims**



1. A portable stove, comprising:

a platform;

a vertically oriented housing having an open bottom mounted on the platform;

a heating means positioned adjacent the bottom of the housing and connected to a fuel source outside of the housing;

a adjustable support means for supporting cooking utensils, and for adjusting the exposure of a cooking utensil to said heating means, positioned above the heating elements in the housing; and

a cover means pivotally attached to a top portion of the housing.

4,944,285

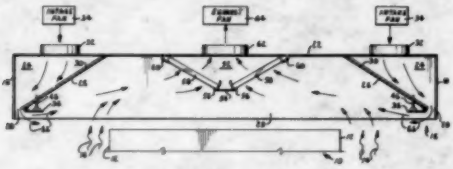
EXHAUST HOOD FOR PIZZA OVENS

Joseph T. Glassman, 303 W. 38th St., Hays, Kans. 67601

Continuation-in-part of Ser. No. 365,765, May 25, 1989, Pat. No. 4,896,657. This application Oct. 30, 1989, Ser. No. 428,626

Int. Cl.[5] F24C *15/20*

U.S. Cl. 126—299D 3 Claims



1. In an exhaust system for a stationary pizza oven, the improvement comprising:

an overhead hood mounted above the oven, said hood having opposite sides extending along the hood from front to back and a top panel extending between said sides and from front to back;

a pair of inclined walls angling at an inclined orientation from the top panel of the hood toward the respective opposite sides thereof to provide a pair of air intake plenums extending along said sides and along said top panel, each inclined wall terminating in an edge spaced from the corresponding side of the hood to define an elongate outlet slot for discharging air from the corresponding intake plenum;

an exhaust plenum located substantially midway between said said intake plenum and extending along said top panel from front to back;

an exhaust duct connecting with said exhaust plenum through said top panel;

exhaust fan means for drawing air from the hood into said exhaust plenum and out through said exhaust duct in a manner to subject the entirety of the exhaust plenum to substantially equal pressure;

an intake duct for each intake plenum connecting therewith through said top panel;

filter means for filtering grease from the air which enters said exhaust plenum; and

intake fan means located outside of said intake plenum for forcing outside air into each of said intake ducts in a manner to subject the entirety of intake plenums to substantially equal pressure for discharge of incoming air therefrom through said outlet slots in a pair of high velocity air streams flowing in the hood in opposite directions toward said exhaust plenum to draw heat and vapor from the oven into said air streams by induction for passage therewith through said filter means.

4,944,286

IMMERSIBLE WATER HEATER

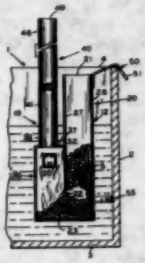
Richard S. Millington, 1823 S. Ash Park La., Boise, Id. 83709

Filed Oct. 2, 1989, Ser. No. 415,761

Int. Cl.[5] F24B *9/00*

U.S. Cl. 126—367 7 Claims

1. An immersible water heater for water tanks comprising an elongated, combined air and solid fuel intake tube; means forming a combustion chamber located immediately adjacent in side by side relationship with said intake tube; a chimney mounted vertically over and in communication with a top wall of said combustion chamber, said air-fuel intake tube being substantially vertically oriented, and provided at its upper most end with a top opening for receiving fuel and air, said combustion chamber and fuel intake tube including a common horizontal wall and a common side wall extending from a top of said combustion chamber toward and spaced from said common bottom wall to provide an unobstructed port opening laterally into said combustion chamber for gravity feed of fuel placed within the intake tube to said combustion chamber, and said chimney having a top opening above the level of said top opening of said air-fuel intake tube for providing an air draft,



after ignition, operable to cool fuel within said intake tube and to cause combustion of fuel only within said combustion chamber.

4,944,287

FLEXIBLE TUBE OF ENDOSCOPE

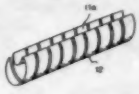
Nagashige Takahashi, and Teruo Ouchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,542

Claims priority, application Japan, Mar. 29, 1988, 63-77817; Mar. 29, 1988, 63-77818; Apr. 8, 1988, 63-87739

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 5 Claims



1. An elongated flexible tube that constitutes an insert part of an endoscope, comprising:

a spiral tube made of a precipitation hardening metal and having a groove which is recessed inwardly from the outer surface of said tube, said groove extending in a straight line along the axis of said tube, said spiral tube being subjected to age hardening process after a solid solution treatment;

a braided-wire tube formed by weaving fine metal wires into a braid, said braided-wire tube being closely fitted over the outer surface of said spiral tube; and

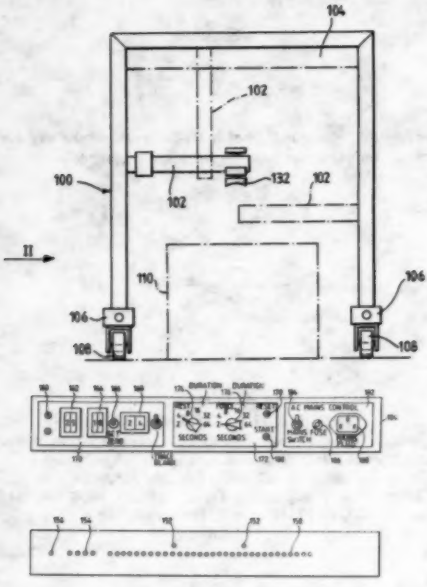
a flexible skin closely and watertightly fitted over the outer surface of said braided-wire tube.

4,944,288

PHYSIOTHERAPY APPARATUS

John Rawcliffe, 11 Rutland Avenue, Atherton, Manchester, England M29 9HN

Continuation of Ser. No. 852,616, Apr. 16, 1986, Pat. No. 4,844,055. This application Dec. 7, 1988, Ser. No. 281,196
Claims priority, application United Kingdom, Apr. 18, 1985, 8509968
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] A63B *21/00*
U.S. Cl. 128—25 R 8 Claims



1. Programmable exercising apparatus comprising: resistance means for resisting a force applied by a patient contracting muscles associated with a limb or body part pressed against the resistance means, and a preset graphic display rest duration indication means, said preset graphic display rest duration indication means being adapted to issue a rhythmic "count-down" signal prior to a predetermined starting time at which the patient is required to exert force against said resistance means.

7. Exercising apparatus comprising: resistance means for resisting a force applied by a patient contracting muscles associated with a limb or body part pressed against the resistance means, a force indicator adapted to give an indication of force applied by the patient to said resistance means, adjustable force duration indication means adapted to give a signal so long as a force at least equal to a preselected target force is exerted on said resistance means, and rest duration indication means adapted to give a signal of predetermined duration indicating the length of a required rest period between muscular contractions of the patient, said rest duration means being further adapted to issue a rhythmic "count-down" signal prior to a predetermined starting time at which the patient is required to exert force against said resistance means.

4,944,289

METHOD AND APPARATUS FOR HEADACHE RELIEF

Charles J. Matthews, Medical Arts Building, Suite 104, 1135 Carthage St., Sanford, N.C. 27330

Filed Oct. 24, 1989, Ser. No. 426,118
Int. Cl.[5] A61H *7/00*; A61F *5/08, 5/24, 13/12*
U.S. Cl. 128—60 15 Claims

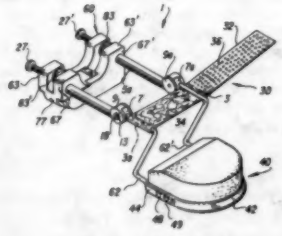
1. A headache relieving headband comprising:
an annular strip of material having an outwardly presented surface and an inwardly presented surface;
a channel means defined by said inwardly presented surface and said outwardly presented surface extending longitudinally along at least a portion of said annular strip of material;
a plurality of resilient protuberance means adjustably positioned within said channel means adapted to apply pressure simultaneously to preselected points on the cranium, whereby when the headband is placed around the head of a wearer above the ears, it provides concentrated pressure to selected points of the cranium which are known to contribute to alleviating headaches.

4,944,290

ADJUSTABLE SPLINT

George R. Hepburn, Severna Park, Md., assignor to Dynasplint Systems, Inc., Baltimore, Md.

Filed Aug. 9, 1988, Ser. No. 229,967
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—87 R 6 Claims



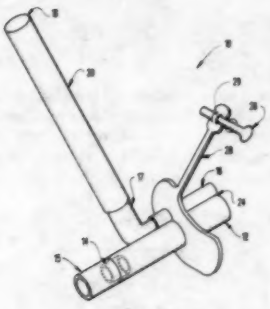
1. An adjustable splint assembly comprising a distal strut and a proximal strut pivotably connected to said distal strut, one of said struts having at one end a pivotably mounted head portion defining a cam surface, an adjustable biasing means mounted within the other strut and biased into engagement with said cam surface, for applying a quantifiable force tending to proximate or align said upper and lower struts, a limb cradle slidably mounted on the distal strut and defining an area in which a limb is received, means for adjusting said cradle to vary the size of said area so as to accomodate a limb part of different size, a platform for supporting a proximal limb part, means connecting said platform to the proximal strut, said platform being longitudinally adjustable, and means for securing said splint assembly to the limb.

4,944,291

DEVICE AND PROCESS FOR HYGIENIC MOUTH TO MOUTH ARTIFICIAL RESPIRATION

G. Neil Robertson, II, 1801 Hanover Dr., B-904, Davis, Calif. 95616, and Truman F. Allen, 316 California Ave., #326, Reno, Nev. 89509

Filed Aug. 31, 1988, Ser. No. 239,115
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—203.11 2 Claims



1. A device for use by an attendant in performing hygienic mouth to mouth artificial respiration on a patient, comprising:

a mouth mask formed from a flexible elastomeric material configured for conforming and sealing engagement over a patient's mouth;

a first tube formed from a clear plastic flexible material extending in sealing relation through said mask;

a first end of said first tube extending substantially through said mask and adapted for insertion into a patient's mouth;

a second end of said first tube extending substantially through said mask and having a mouthpiece adapted for insertion into an attendant's mouth;

a one way check valve in said first tube for allowing air to be blown into said second end by an attendant and out said first end into a patient's mouth and for preventing exhaled air from a patient from returning through said second end;

a second tube formed from a clear plastic flexible material extending in sealing relation through said mask, adjacent said first tube;

a first end of said second tube extending substantially through said mask and adapted for insertion into a patient's mouth;

a second end of said second tube extending substantially through said mask and having an elbow for directing exhaled air from a patient away from an attendant;

an elongated exhaust air conduit formed from a clear flexible plastic material connected to said elbow, said conduit having an outlet disposed remotely from said mouthpiece on said first tube;

an elongated flexible tether formed from an elastomeric material integrally with said mask;

a slotted portion formed adjacent a free end of said tether;

a nose clip inserted through said slotted portion and adapted for sealing engagement with a patient's nose; and

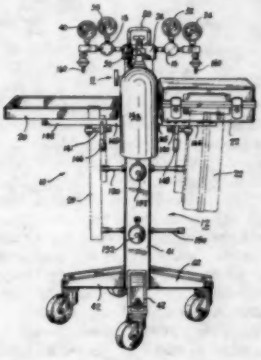
said tether extending from a top portion of said mask and dimensioned to position said nose clip adjacent a patient's nose upon placement of said mask into engagement with a patient's mouth.

4,944,292

MOBILE RESUSCITATING APPARATUS

John C. Gaeke, deceased, late of Westlake, Ohio, and by Louise Gaeke, executrix, 2245 Marshfield Blvd., Westlake, Ohio 44145, assignors to Louise M. Gaeke, Sequel, Calif.

Continuation of Ser. No. 712,541, Mar. 15, 1985, abandoned.
This application Mar. 31, 1987, Ser. No. 33,904
Int. Cl.[5] A61M *15/00*
U.S. Cl. 128—204.18 5 Claims



1. A portable resuscitating apparatus comprising:

a mobile support stand which can be maneuvered;

a storage container attached to the stand for storing patient resuscitating equipment;

a manifold body mounted on the stand, said manifold body defining a mounting surface to engage the stand and further defining a first output port and a second output port in fluid communicating with an oxygen delivery conduit in said body coupled to at least one oxygen inlet port for routing oxygen through said oxygen delivery conduit;

a handle attached to the manifold;

first and second flow control means coupled to said first and second output ports on said manifold, said first flow control means having a first valve and a manual adjusting means for controlling a pressure of oxygen routed to a patient and said second flow control means having a second valve and a manual adjusting means for controlling a volume per unit time of oxygen to a patient, each of said first and second flow control means further having an output nozzle;

a pressurized oxygen source connected to the manifold for routing oxygen through the oxygen inlet port through the oxygen delivery conduit to the first and second flow control means;

routing means coupleable to the nozzle of one of said first and second flow control means for directing pressurized oxygen to a patient; and

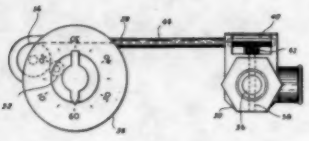
a release mechanism coupled to the manifold having friction means for frictionally engaging the stand and means for releasing the friction means from engagement with the stand to allow the manifold, flow control means, oxygen source and routing means to be disconnected from the stand and carried via the handle.

4,944,293

TIMED OXYGEN BREATHING APPARATUS TRAINER

Edmund Swiatosz, Maitland, and Paul D. Grimmer, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1989, Ser. No. 374,128
Int. Cl.[5] A62B *9/02*
U.S. Cl. 128—205.24 **5 Claims**



1. In an apparatus that can be utilized as a simulator of a breathing apparatus that is used as a means to provide the user with a supply of oxygen that is exhaustible within a predictable period of time and that has a face mask to be worn by the user with an inhalation tube attached thereto to communicate breathable air from a reservoir upon demand by the user until the oxygen supply is exhausted, an improvement to said simulator to diminish the supply of oxygen at the expiration of said period and simulate for the trainee the corresponding experience encountered by the user of the operational breathing apparatus, comprising:

means associated with said inhalation tube and operable for restricting the flow of said breathable air;

means responsive to said time period and coupled to said flow restricting means for operating said flow restricting means at the expiration of said time period;

wherein said flow restricting means comprises a valve within the airflow path to said trainee and upstream said reservoir, and said operating means is a mechanism external the airflow path that is connected to said restricting means by a mechanical linkage;

wherein said restricting means includes a housing attachable to, and in the airflow path between, said reservoir and said inhalation tube, and said valve is a butterfly valve affixed to a shaft extending external the airflow path;

wherein said shaft is spring loaded to position said valve in a normally open position to permit maximum airflow from said reservoir to said inhalation tube, and wherein said shaft includes an enlarged portion forming an axial drum; and,

wherein said mechanical linkage is attached to said drum and windable thereabout such that when said linkage is withdrawn tangentially from about said drum, said drum, shaft and butterfly valve are caused to rotate about the axis of said shaft and thereby alter the orientation of said path valve within and with respect to said airflow path.

4,944,294

FACE MASK WITH INTEGRAL ANTI-GLARE, ANTI-FOG EYE SHIELD

Theodore S. Borek, Jr., 33 Allen Rd., Longmeadow, Mass. 01106

Filed Apr. 20, 1988, Ser. No. 183,783
Int. Cl.[5] A62B *18/00, 18/02*; A61F *9/04*
U.S. Cl. 128—206.19 **2 Claims**

1. A combined face mask and eye shield comprising:

a. a non-woven mask adapted in size and shape to fit over the mouth and nostrils of a wearer, said mask having fastening means for attaching the mask onto a wearer's face;

b. a transparent eye shield connected at a bottom portion thereof to a top portion of the mask in a laterally offset manner by at least two sponge strips attached between the shield and mask, said sponge strips being spaced apart to provide a gap between the strips, shield and mask, wherein said shield is made of plastic that has been coated with an anti-fogging agent to prevent the wearer's breath from fogging up the shield when the mask is worn; and

c. an upper sponge strip that is attached to a top portion of the shield, wherein said upper strip is adapted in size and shape to sit against and span the wearer's forehead when

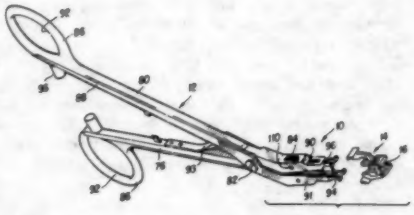
the mask is worn, whereby all the aforementioned sponge strips cooperate to space the shield sufficiently away from the wearer's face to prevent the wearer's eyelashes from contacting the shield, while positioning the upper strip to block sweat from dropping off the wearer's forehead into his eyes.

4,944,295

SUTURING ASSEMBLY

Owen M. Gwathmey, The Meadow, Box 96, Aylett, Va. 23009; Thomas E. Sloane, Jr., West Redding, Conn., and Robert R. Oddsen, Centerport, N.Y., assignors to Owen Gwathmay, Aylett, Va.

Division of Ser. No. 18,662, Feb. 25, 1987, Pat. No. 4,809,695, and a continuation-in-part of Ser. No. 313,514, Oct. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 175,787, Aug. 6, 1980, abandoned. This application Feb. 7, 1989, Ser. No. 307,116
Int. Cl.[5] A61B *17/04, 17/08*; B31B *1/00*; F16B *15/00*
U.S. Cl. 227—176 **9 Claims**



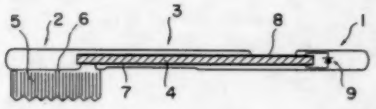
1. A cartridge for holding a tissue-suturing staple, said cartridge comprising at least three separate pieces as follows:

a carrier having a linear track formed thereon; and

first and second opposite slidable jaws mounted on said carrier, each of said jaws having a follower means for engaging and riding on said linear track, a cartridge jaw gripper being attached to said follower means for engaging a staple, and a tool engagement means being attached to said follower means for mounting the cartridge on a tool for causing said first and second opposite slidable jaws to move linearly toward one another,

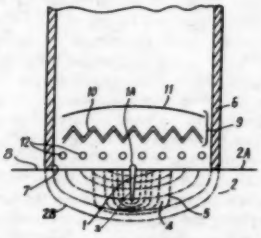
whereby said cartridge can be selectively mounted on said tool by engaging each of the cartridge jaws with the tool and a staple can be placed between the jaw grippers for being compressed by linear movement of the jaw grippers upon manipulation of the tool.

4,944,296
ELECTRONIC TOOTHBRUSH
Hideo Suyama, 65, Higashi-Juban, Sendai-Shi, Miyahi, Japan
Filed Aug. 10, 1988, Ser. No. 230,752
Claims priority, application Japan, Aug. 10, 1987, 62-198119; Jan. 5, 1988, 63-519
Int. Cl.[5] A61N 1/30
U.S. Cl. 128—393 6 Claims



1. An electronic toothbrush comprising: a piezo-electric element with piezo-electric characteristic mounted in a handle between a gripped portion and a brushing portion of said electronic toothbrush for producing an electrical potential upon deformation due to use of the toothbrush by a user; an exposed electrode disposed in close vicinity to said brushing portion and an opposite exposed electrode disposed on said gripped portion of said handle formed on both sides of said piezo-electric element, said electrodes disposed such that said exposed electrode is in electrical contact with mouth of user during use of toothbrush by user and said opposite exposed electrode is in electrical contact with hand of user during use of toothbrush by user; and a diode with a rectifying action electrically connected to said electrodes formed on both sides of said piezo-electric element so as to cause an essentially unidirectional potential to be produced by said piezo-electric element.

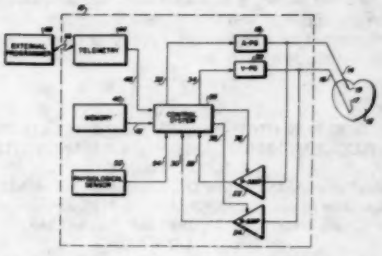
4,944,297
PORTABLE APPARATUS FOR LOCALIZED HEATING OF THE SKIN FOR THERAPEUTIC PURPOSES
Georges Ratkoff, 7 chemin de la Guinguette La Taye, 28120 Illiers Combray, and Jean-Paul Deheuvels, 12 rue de Beauce Barjouville, 28630 Chartres, both of France
Filed Sep. 27, 1988, Ser. No. 249,759
Claims priority, application France, Oct. 7, 1987, 87 13825
Int. Cl.[5] A61F 7/00
U.S. Cl. 128—399 12 Claims



1. Apparatus for localized heating of the skin for therapeutic purposes, in particular for destroying venom injected into the skin by the sting or bite of certain insects and sea creatures, the apparatus comprising:

a hollow elongated body having an open end, a source of heat flux mounted in the hollow body and set back from said open end, a reflector placed in said body behind said source relative to the open end for directing energy radiating from said source to said open end, and an energy supply source contained in the body and connected to the heat flux source in a manner which is interruptible at will, wherein the heat flux source has a predetermined power output and the open end has a predetermined free area such that the ratio between the power of the heat flux source and the free area of the open end lies in the range 0.03 W/mm^2 and 0.30 W/mm^2.

4,944,298
ATRIAL RATE BASED PROGRAMMABLE PACEMAKER WITH AUTOMATIC MODE SWITCHING MEANS
Jason A. Sholder, Northridge, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.
Filed May 23, 1989, Ser. No. 355,588
Int. Cl.[5] A61N 1/00
U.S. Cl. 128—419 PG 20 Claims



1. An improved dual chamber pacemaker having programmable modes of operation, said pacemaker being capable of stimulating the atrial and the ventricular chambers of the heart, said pacemaker including programming means for selectively allowing the pacemaker to be programmed to operate in an atrial rate based mode of operation, and atrial sensing means for sensing atrial activity occurring in the atrial chamber, including atrial rate of said atrial activity, wherein the improvement comprises:

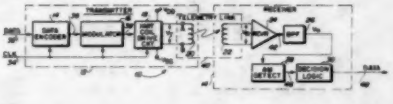
first sensing means for monitoring said atrial rate and sensing whether said atrial rate exceeds a first prescribed threshold;

means for providing a stimulating pulse to a selected chamber of the heart at a maximum upper rate in the event said atrial rate sensed by said first sensing means exceeds said first prescribed threshold;

second sensing means for monitoring said atrial rate above said first prescribed threshold and sensing whether said atrial rate exceeds a second prescribed threshold, said second threshold being at a higher rate than said first threshold; and

means for automatically switching the mode of operation of said pacemaker from said atrial rate based mode of operation to a selected alternate mode of operation in the event said atrial rate exceeds said second prescribed threshold.

4,944,299
HIGH SPEED DIGITAL TELEMETRY SYSTEM FOR IMPLANTABLE DEVICE
Sergiu Silvian, La Crescenta, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.
Filed Aug. 8, 1989, Ser. No. 391,080
Int. Cl.[5] A61N 1/00
U.S. Cl. 128—419 PG 20 Claims



1. Implantable transmitter apparatus for transmitting digital binary data at a prescribed bit rate from an implantable device,

said digital binary data comprising a sequence of incoming data bits, said transmitter comprising:

encoding means for converting said sequence of incoming data bits into an encoded binary data stream, comprising a sequence of encoded data bits, that includes an identifying mark only when a prescribed correlation exists between prescribed ones of said incoming data bits and encoded data bits;

a transmitting coil circuit tuned to said prescribed bit rate; and

means for applying a carrier signal having frequency equal to said prescribed bit rate to said transmitting coil circuit, including switching means for switching the phase of the carrier signal applied to said transmitting coil circuit by a prescribed amount for eacl. identifying mark of said encoded binary data stream.

4,944,300

METHOD FOR HIGH ENERGY DEFIBRILLATION OF VENTRICULAR FIBRILLATION IN HUMANS WITHOUT A THORACOTOMY

Sanjeev Saksena, 33 Fairway Dr., Glenbrook, N.J. 08812

Continuation of Ser. No. 43,489, Apr. 28, 1987, abandoned. This application Jan. 12, 1990, Ser. No. 463,843

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 D **4 Claims**

1. A method for the high energy defibrillation of ventricular fibrillation or cardioversion of ventricular tachycardia in humans, which comprises subjecting the heart to a single bidirectional high energy electrical shock from a first anode and a second anode to a cathode, said shock comprising at least 15 Joules over a period of time of not less than about 2 milliseconds and being delivered to said anodes by an implanted shock generator, said cathode being transvenously positioned in the right ventricle, said first anode being transvenously positioned near the superior vena cava or in the right atrium, said second anode being positioned subcutaneously in the left half side of the chest and outside the rib cage near the axillary line and about at the level of the left fourth intercostal space, said anodes being electrically connected in parallel to said shock generator, said anodes and cathode being connected to said shock generator via implanted leads, and said anodes, cathode, leads and shock generator apparatus having been put into position without a thoracotomy.

4,944,301

METHOD FOR DETERMINING ABSOLUTE CURRENT DENSITY THROUGH AN IMPLANTED ELECTRODE

Gregory P. Widin, and Christopher van den Honert, both of St. Paul, Minn., assignors to Cochlear Corporation, Englewood, Colo.

Filed Jun. 16, 1988, Ser. No. 207,774

Int. Cl.[5] A61N *1/36*

U.S. Cl. 128—420.6 **18 Claims**

1. A method for determining the absolute density of an electrical current passing through an electrode implanted in a body, comprising the steps of:

(a) applying a voltage waveform to said implanted electrode;

(b) measuring the distortion of said waveform introduced by the non-linear I–V characteristics of the interface between said electrode and the tissue of said body; and

(c) estimating the absolute current density of said electrical current through said electrode based on the characteristics of said distortion.

4,944,302

ELECTRONIC DEVICE FOR COSMETIC AND MEDICAL THERAPY

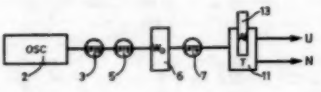
Epifanio J. Hernandez, and José C. Benach, both of Barcelona, Spain, assignors to Indiba, S.A., Barcelona, Spain

Continuation of Ser. No. 880,717, Jul. 11, 1986, abandoned. This application Oct. 26, 1988, Ser. No. 267,510

Claims priority, application Spain, Jul. 8, 1985, 287964; Dec. 12, 1985, 549883

Int. Cl.[5] A61N *1/40*

U.S. Cl. 128—422 **2 Claims**



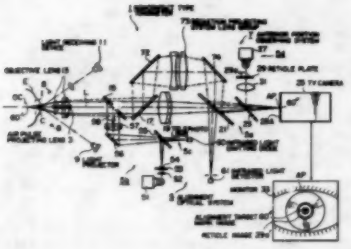
1. An electronic device for use in cosmetic and medical treatment of a person by application to the person's epidermis having a load impedance, comprising: high frequency oscillating circuit means for supplying high frequency current in the range of from 1 to 2 megacycles per second and automatically reducing the supplied power when the load impedance is lowered, said high frequency oscillating circuit means including an oscillating circuit producing an oscillating signal at an output, a pre-amplifier having an input and an output, the input being connected to the oscillating circuit output receiving and boosting said oscillating signal, an amplifier having an input connected to the output of the pre-amplifier receiving the boosted oscillating signal and having an output outputting an amplified oscillating signal, resonant circuit means having an input connected to the amplifier output receiving said amplified oscillating signal and having an output outputting an oscillating signal with resonance at an operating frequency, an output amplifier having an input connected to the output of said resonant circuit means receiving the signal output by said resonant circuit means and having an output outputting an amplified signal at an operating frequency, high frequency transformer means having an input connected to the output of the output amplifier and including a first transformer winding connected to the transformer means input, a second transformer winding inductively coupled to the first transformer winding and a center housing located adjacent said second transformer winding, the housing having an aluminum cylinder arranged as a heat sink for dissipating heat generated by said first and second windings and reducing the load inductance of said first and second windings so as to increase the resonance frequency; and, electrical current application means electrically operatively connected to said second winding of said transformer means for transmitting high frequency current capacitively to the epidermis of the person being treated, said electrical current application means including an active electrode and a neutral return electrode, said neutral electrode adapted to be applied on the epidermis to avoid dispersion of electrical current flow.

4,944,303

NONCONTACT TYPE TONOMETER

Kenjiro Katsuragi, Tokyo, Japan, assignor to Topcon Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,611
Claims priority, application Japan, Dec. 27, 1986, 61-311257; May 21, 1987, 62-124165
Int. Cl.[5] A61B 3/16
U.S. Cl. 128—648 24 Claims



1. A noncontact type tonometer having an orifice tube for discharging a fluid to deform a cornea of an eye under test and an alignment optical system for aligning an axis of the orifice tube with the cornea and viewing the anterior portion of the eye under test, said alignment optical system comprising:

an orifice tube disposed along an axis;

projection means for projecting an alignment target mark onto the cornea of the eye under test, the alignment target mark including light of a first range of wavelengths;

illumination means for illuminating an anterior portion of the eye under test with light of a second range of wavelengths different from said first range of wavelengths;

first imaging optical means, having a first optical axis coaxial with the axis of the orifice tube, for forming an image of the alignment target mark on a plane and for passing light of the first range of wavelengths;

second imaging optical means for forming an image of the anterior portion of the eye on the plane and for passing light of the second range of wavelengths; and

reticle means for providing a reticle image on the plane, the relative positions between the reticle image and at least one of (i) the image of the alignment target and (ii) the image of the anterior portion of the eye formed on the plane being indicative of the relative positions of the axis of the orifice tube and the cornea.

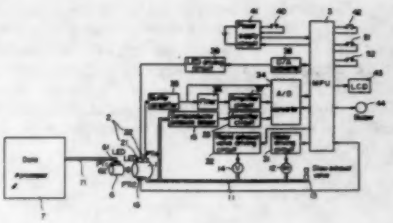
4,944,304

ELECTRONIC SPHYGMOMANOMETER

Teruya Nishina, 4-19-403, Kita Kawara Machi, Kameoka-city, Kyoto, Japan

Filed Aug. 15, 1988, Ser. No. 232,040
Claims priority, application Japan, Aug. 14, 1987, 62-203282
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—667 4 Claims

1. An electronic sphygmomanometer comprising a cuff, a pulse wave detecting photoelectronic sensor comprising a light-emitting element and a light-receiving element which are disposed on said cuff, memory means for storing measured data, mode selecting means for selecting either a measuring mode or a transmitting mode; and means for allowing the light-emitting and -receiving elements of said pulse wave detecting photoelectric sensor to be used as light-emitting and



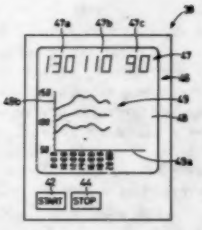
-receiving elements for tranmission of measured data in said transmitting mode.

4,944,305

BLOOD PRESSURE MONITORING APPARATUS

Nariyasu Takatsu, and Hidenobu Nakashima, both of Kasugai, Japan, assignors to Colin Electronics Co., Ltd., Aichi, Japan

Filed Apr. 20, 1989, Ser. No. 343,522
Int. Cl.[5] A61B 5/02
U.S. Cl. 128—683 18 Claims



1. A blood pressure monitoring apparatus for repetitively measuring blood pressure of a subject, comprising:

measuring means for measuring at least one of a maximum, a minimum and an average blood pressure of a subject at each of repetitive measuring cycles; and

display means for displaying a time-wise varying trend of said at least one of maximum, minimum and average blood pressure, by indicating a graph representing the repetitively measured values of said at least one blood pressure in a two-dimensional table defined by a first axis indicative of time and a second axis indicative of blood pressure.

4,944,306

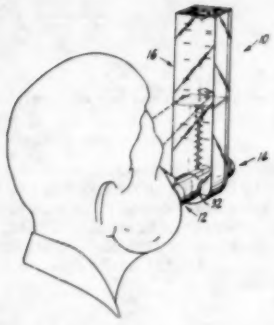
SPIROMETER FOR PULMONARY MEASUREMENT

Frank J. Alvino, North Caldwell, N.J., assignor to Healthscan, Inc., N.J.

Continuation of Ser. No. 107,878, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 912,642, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 715,563, Mar. 25, 1985, abandoned. This application Oct. 11, 1989, Ser. No. 420,658
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—725 1 Claim

1. A spirometer comprising a vertically-oriented chamber having opposed front and back walls, an open top formed as a pair of exit passageways divided by an upper central bridge element between said front and back walls, and an open bottom formed as a pair of entrance passageways divided by a lower central bridge element between said front and rear walls; a

hollow inlet member mounted to and projecting outwardly from said front wall at the lower end thereof; a hollow outlet member mounted to and projecting outwardly from said back wall at the lower end thereof, said outlet member including an outlet orifice of reduced diameter at the distal end thereof, the interior of said inlet and outlet members being joined to the interior of said chamber through said entrance passageways to allow the passage of air therethrough; a piston mounted in said chamber for vertical movement therein; a guide rod centrally mounted within said chamber, the opposed ends thereof being supported by said upper and lower central bridge elements,



said piston having a vertical central throughbore whereby said piston is mounted on said guide rod; spring means mounted to said piston to urge said piston to a lower retracted position, said piston being movable upward along said guide rod in response to a flow of air through said inlet member into said chamber; an indicator mounted within said chamber for upward movement with said piston; a vertical slot located in a wall of said chamber; a shank extending from said indicator through said vertical slot and terminating in an enlarged head externally of said chamber; and a helical compression spring encircling said shank and entrapped between said indicator element and the inside face of said chamber bordering said slot.

4,944,307

INTRAUTERINE CATHETER

Edward H. Hon, Bradbury; Robert W. Hon, Los Altos, and Edward D. Hon, San Francisco, all of Calif., assignors to The Hon Group, Encino, Calif.

Filed Aug. 22, 1988, Ser. No. 234,546

Int. Cl.[5] A61B *5/03*

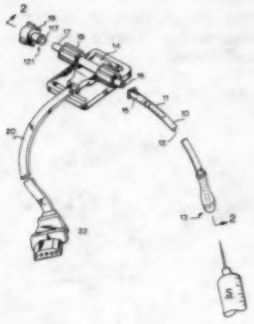
U.S. Cl. 128—748 **32 Claims**

1. An intrauterine catheter for measuring intrauterine pressure comprising:

(a) an elongated flexible catheter tube having a uterine end and a gauge end for providing a liquid c. apling from a uterus to a suitable pressure measuring device;

(b) a flexible membrane member enclosing the uterine end of said flexible catheter tube, said flexible membrane member includes a rigid structure for supporting at least a portion of said membrane member;

(c) a hollow filling tube fitted within said catheter tube extending to substantially the uterine end of the said catheter tube;



(d) a pressure measuring device having a first input and a second input, said pressure measuring device connected to said gauge end of said catheter tube.

4,944,308

TISSUE SAMPLING DEVICE

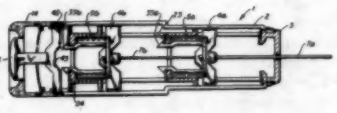
Dan Åkerfeldt, Uppsala, Sweden, assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 14, 1988, Ser. No. 270,368

Claims priority, application Sweden, Nov. 19, 1987, 8704559

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—751 **16 Claims**



1. A tissue . mpling device comprising:

a housing having front and rear housing ends and defining a longitudinal axis extending between said front and rear housing ends, and said front housing end having an opening therethrough;

a hollow first needle positioned within said housing and extendable from said opening, said hollow first needle being moveable along said axis;

a second needle extending through said hollow first needle and movable along said axis, said second needle having a tip which is extendable from said hollow first needle and said opening, and said second needle further including a tissue sample receiving recess;

a first needle head coupled to said hollow first needle and mounted within said housing for movement along said axis to move said hollow first needle along said axis;

a second needle head coupled to said second needle and mounted within said housing for movement along said axis to move said second needle along said axis;

a first spring disposed within said housing and bearing directly against said second needle head, said first spring being capable of being placed into an energized mode to store energy, and said first spring being releasable from said energized mode to propel said second needle head along said axis towards said opening, such that said tip of said second needle is extended from said hollow first needle, whereby a tissue sample can be captured within said recess;

a second spring positioned within said housing and bearing directly against said first needle head, said second spring

being capable of being placed into an energized mode to store energy, and said second spring being releasable from said energized mode to propel said first needle head along said axis towards said opening, said hollow first needle being extended from said opening such that said recess of said second needle is enclosed by said hollow first needle;

a first latch means selectively releasable from outside said housing for releasably holding said first spring in said energized mode; and

a second latch means for releasably holding said second spring in said energized mode, said second latch means being releasable in response to and subsequent to release of said first spring.

4,944,309

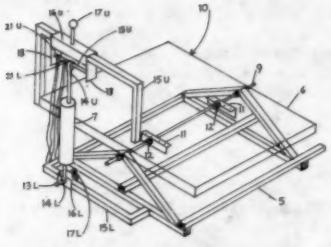
MEASURED VARIABLE RESISTANCE TILTBOARD

Richard W. Mechling, 830 Vedado Way NE., Atlanta, Ga. 30308

Filed Dec. 6, 1988, Ser. No. 280,360

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—782 **5 Claims**



1. In a variable resistance tiltboard including a platform pivotably supported above a base, and variable resistance means for providing a selectively variable resistance to the movement of said platform relative to said base operatively associated with said platform and said base, the improvement which comprises:

measuring means operatively associated with said platform and said variable resistance means for the instantaneous determination of the force applied by said variable resistance means against movement of said platform.

4,944,310

DEVICE FOR TREATING SNORING SICKNESS

Colin E. Sullivan, Birchgrove, Australia, assignor to Somed Pty. Ltd., Australia

Continuation of Ser. No. 941,542, Dec. 11, 1986, abandoned, which is a continuation of Ser. No. 773,244, Sep. 3, 1985, abandoned, which is a continuation of Ser. No. 456,046, Dec. 22, 1982, abandoned. This application Dec. 29, 1988, Ser. No. 292,646

Claims priority, application Australia, Apr. 24, 1981, PE8570

Int. Cl.[5] A62B *18/02*

U.S. Cl. 128—848 **12 Claims**

1. Apparatus for maintaining continuous positive airway pressure, said apparatus comprising a nose piece shaped to fit over the nose of a user and defining a first chamber; a large bore inlet tube entering into a second chamber attached to said nose piece and in fluid communication with said first chamber only via at least one orifice interconnecting said chambers, said second chamber having a large bore exit to the atmosphere including continually open resistance means to provide a resistance to the flow of gases through said exit and being located adjacent to said exit; and means to releasably seal said nose piece against the facial skin of said user adjacent to said nose to effect a pressure tight seal of said first chamber; said inlet tube connected to a high volume supply of air to cause a high volume of air to flow through said inlet tube, into said second chamber and out said resistance means, said resistance means causing the pressure within said second chamber to be elevated above, and maintained above, atmospheric pressure, said at least one orifice transmitting said elevated pressure to said first chamber, and the flow of air passing between said second chamber and said first chamber through said orifice being substantially equal to the air inhaled and exhaled by said user via the nose.

4,944,311

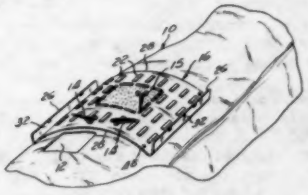
SURGICAL INSTRUMENT RETAINER

John D. Eldridge, Jr., and Mary A. Morgan, both of Newport Beach, Calif., assignors to Jodel Medical Products, Inc., Santa Ana, Calif.

Filed Mar. 9, 1988, Ser. No. 166,480

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—849 **14 Claims**



1. An apparatus for retaining surgical instruments adjacent a surgical field, comprising:

a drape having a top surface on which surgical instruments are rested and a bottom surface which lays on a patient, said drape being flexible so as to conform to said patient;

a plurality of instrument retaining magnets secured to said drape and oriented to that when a magnetizable surgical instruments is placed on said top surface of said drape adjacent one of said magnets, the force of magnetic attraction between said magnet and said instrument will cause said instrument to be retained in place on said top surface of said drape;

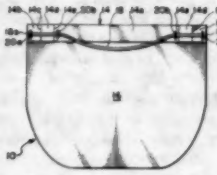
a peripheral portion of said drape being maintained in a non-planar configuration, said peripheral portion preventing surgical instruments from falling off said drape during a surgical procedure in the event that insufficient magnetic attraction is achieved to retain said instrument on said top surface, said drape thereby retaining and providing access to said surgical instruments so as to enable repeated placement of said instruments on said drape and removal of said instruments from said drape during the course of a surgical procedure; and

the means for reversibly causing deformation of said peripheral portion of said drape, said deformation causing means maintaining said non-planar configuration of said peripheral portion, wherein said deformation causing means comprises a deformable strip of metallic material secured to said drape.

4,944,312
DISPOSABLE FACE SHIELD

B. Stewart Smith, 9016½ Pico Blvd., Los Angeles, Calif. 90035

Filed Sep. 11, 1989, Ser. No. 405,445
Int. Cl.[5] A62B *18/08*; A41D *13/00*
U.S. Cl. 128—857 14 Claims



1. A light-weight, disposable face shild assembly for the protection of the eyes and face of a wearer from accidental exposure to infectious, hazardous and undesirable substances, said face shield assembly comprising:

(a) a semi-flexible forehead support strip and a semiflexible protective face panel support strip, said forehead support strip being joined at each of its ends to one of the ends of said face panel support strip, said forehead support strip being oriented in parallel relationship to said face panel support strip, and said forehead support strip including a central strip portion, relatively short intermediate strip portions foldable to and extending outwardly from said central portion, and relatively short end strip portions foldable to and extending outwardly from said intermediate strip portions;

(b) a generally rectangular, semi-flexible, transparent protective face panel affixed at its upper edge portion to said face panel support strip and depending downwardly therefrom; and

(c) an elastic head band having each of its ends affixed to an end of said forehead support strip proximate the point of joinder of said forehead support strip to said face panel support strip, said head band extending through slip fastener means associated with the central strip portion of said forehead support strip proximate to fold lines between said central portion and said intermediate portions, the intermediate strip portions of said forehead support strip being foldable to said end portions of said forehead support strip and the ends of said face panel support strip being held in substantial abutment to the ends of the central strip portion of said forehead support strip when said head band is pulled through said slip fastener means and placed in tension about the head of the wearer of said face shield assembly whereby the semi-flexible forehead support strip in its central portion forms into an arcuate shape surrounding the forehead of the wearer and supports the semiflexible protective face panel support strip with said affixed transparent protective face panel in arcuate spaced face protection orientation on the head of the wearer.

4,944,313
SINGLE-USE ANNULAR MOUTHPIECE

Seymour Katz, Glen Cove, N.Y., and Marna L. Schirmer, Norwalk, Conn., assignors to E-Z-EM, Inc., Westbury, N.Y.

Filed Sep. 6, 1989, Ser. No. 403,693
Int. Cl.[5] A61B *1/00*
U.S. Cl. 128—859 23 Claims

1. A single-use annular mouthpiece comprising:

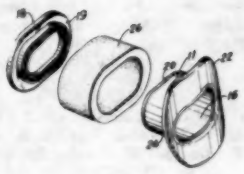
a relatively rigid portion including an annular main body shaped and dimensioned to be held in a patient's mouth and to provide clearance for tubing through its central opening,

an annular lip extending radially out from said main body at one end thereof,

an annular flange extending radially out from said main body at the other end thereof, said flange being shaped and dimensioned to overlie a patient's lips; and

a compressible annular portion severable from and mounted around to overlie said annular main body of said rigid portion,

said portion being sized and shaped to encircle said main body portion and to fit between said lip and said flange,



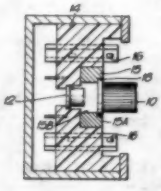
the outer periphery of said lip extending radially out no further than the outer surface of said compressible annular portion,

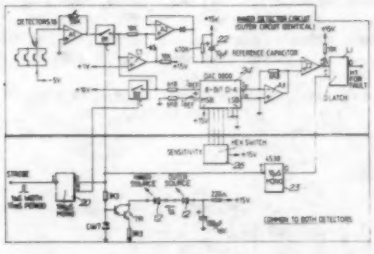
whereby said mouthpiece is usable in medial and surgical procedures which require both protection for tubing used with the mouthpiece and protection for the patient undergoing the procedure.

4,944,314
CIGARETTE ENDS TESTING

Reginald C. Bolt, Saunderton, England, assignor to Molins PLC, Milton Keynes, England

Filed Jul. 30, 1987, Ser. No. 79,525
Claims priority, application United Kingdom, Jul. 30, 1986, 8618639
Int. Cl.[5] A24C *5/32*, *5/34*
U.S. Cl. 131—280 7 Claims





1. A device for testing the ends of cigarettes, comprising:

means for conveying cigarettes sideways through a test station past a source of light arranged to direct light across the entire cross section and into the ends of successive cigarettes using a wide-angle diverging beam capable of

illuminating the entire wrapper around an inadequately filled cigarette end in such a way that the paper wrapper around the end of each cigarette is illuminated if there is insufficient tobacco in the end, wherein the light from said wide angle diverging beam is directed in an unimpeded manner into the end of the cigarette; means for monitoring external illumination at the end of the cigarette, including at least one light detector positioned to detect light passing through the wrapper at the end of a cigarette at said test station; and means responsive to an output signal from said monitoring means for generating a fault signal upon detection of a cigarette having insufficient tobacco in the end.

5. A device for testing the ends of cigarettes, comprising a source of light arranged to direct a wide-angle diverging beam of light across the entire cross section and into the ends of successive cigarettes being conveyed sideways through a test station so that the paper wrapper around the end of each cigarette is illuminated to the extent that insufficient tobacco is provided in the end thereof, wherein the light from said wide angle diverging beam is directed in an unimpeded manner into the end of the cigarette; means for detecting external illuminating passing through the wrapper at the end of each cigarette so as to produce a series of test pulses each having an amplitude indicative of the level of illumination detected for a respective cigarette; and control means for evaluating the test pulse from each cigarette against a reference signal derived from the test pulses of satisfactory cigarettes tested previously during a predetermined time interval, including means connected to receive said test pulses from said detecting means for producing a reference potential representing an average of a plurality of test pulses, comparator means connected to receive said reference potential and said test pulses for comparing the individual test pulses to said reference potential and for generating a fault signal when a test pulse exceeds said reference potential, and controllable means connected between said detecting means and said comparator means for adjusting the level of said test pulses by a selected proportion and for applying said adjusted test pulses to said comparator means for comparison with said reference potential.

4,944,315
APPARATUS FOR THE PRODUCTION AND PACKAGING OF CIGARETTES

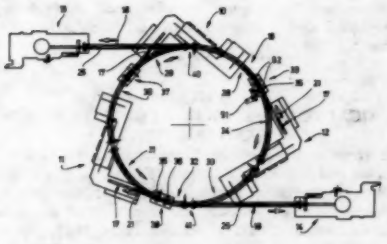
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,455

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3742955

Int. Cl.[5] A24C 5/35

U.S. Cl. 131—283 **12 Claims**



1. In an apparatus for the production and packaging of cigarettes and containing at least one cigarette producing machine and at least one packaging machine, the cigarette producing machine and the packaging machine being connected to one another by a cigarette conveyor which conveys a stream of cigarettes and which is oriented transversely relative to a conveying direction from the cigarette producing machine to the packaging machine, the improvement wherein:

said cigarette conveyor comprises: a circular cigarette store (16) designed as a continuous-flow store for receiving a stream of cigarettes; means for feeding cigarettes (15) to said circular cigarette store (16) from at least one entry station (37, 38, 39); and means for extracting said cigarettes (15) from said circular cigarette store (16) at at least one extracting station (40, 41), said extraction station being spaced from the entry station; and

said circular cigarette store (16) comprises a plurality of driven storage belts (28, 29, 30, 31, 32, 33, 34) which form a closed circular ring and which have a respective upper strand (46) which is guided in a horizontal plane and on which the cigarette stream (43) is stored and conveyed from an entry station to an extraction station.

4,944,316
PROCESS FOR TREATING TOBACCO AND SIMILAR ORGANIC MATERIALS

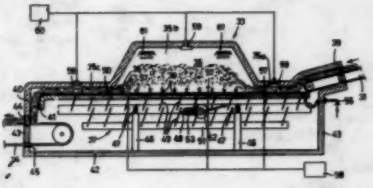
Oskar Stuhl, An der Thomaskirche 23, D-400 Düsseldorf 30, and Klaus-Dieter Wenzel, Am Kaiserwald 7, D-5503 Konz, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 30,800, Mar. 27, 1987. This application Mar. 21, 1988, Ser. No. 171,330

Claims priority, application European Pat. Off., Apr. 22, 1987, 87 105 912.7

Int. Cl.[5] A24B 3/18

U.S. Cl. 131—296 **10 Claims**



1. A process for treating tobacco and similar organic materials comprising

(a) impregnating the organic materials with an inert organic liquid and heating the impregnated materials above the boiling point of said inert organic liquid by contacting with a hot first gas under conditions which result in vaporization of the inert organic liquid and expansion of the organic materials,

(b) recovering a portion of the vaporized inert organic liquid and collecting expanded organic materials containing residual amounts of said inert organic liquid,

(c) subjecting the expanded organic materials to microwave radiation in a microwave chamber to vaporize the residual amounts of inert organic liquid contained in the expanded organic materials and

(d) introducing a second gas into contact with the expanded organic materials while the expanded organic materials are being subjected to said microwave radiation whereby the inert organic liquid is expelled from the expanded organic materials and is carried away by said second gas.

4,944,317
TOBACCO PORTION

Martin Thal, Tullinge, Sweden, assignor to Svenska Tobaks AB, Sweden

Filed Sep. 30, 1988, Ser. No. 251,232

Claims priority, application Sweden, Oct. 5, 1987, 8703827

Int. Cl.[5] A24D 1/14

U.S. Cl. 131—348 **1 Claim**

1. An individually prepackaged tobacco portion including a

portion of tobacco, an inner container, an outer container and a cover,

said tobacco portion located in said inner container,

said inner container formed of a thin, deformable metal foil having an open top, a perforated bottom wall and an imperforate side wall,

said outer container formed of an air and moisture impervi-

ous material having an open top and imperforate side and bottom walls with a flange surrounding said open top,

said cover being formed of an air and moisture impervious material and being adhered to said flange of said outer container, and

said inner container formed and adapted to nest in said outer container with the side and bottom walls of said inner and outer container in contact respectively with one another.

4,944,318

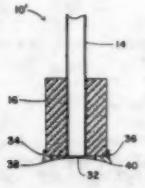
NAIL POLISH APPLICATOR

Thurmood O. Gaylord, Jr., and Thurmond O. Gaylord, Sr., both of 455 Uvalde, Houston, Tex. 77015

Filed Nov. 7, 1988, Ser. No. 268,280

Int. Cl.[5] A45D *29/00*

U.S. Cl. 132—73 **1 Claim**



1. A nail polish applicator, comprising:

an elongated shank member;

a bottle cap on one end of said shank member;

a rectangular sponge secured on an opposite end of said shank member;

said shank member extending through a central passage in said sponge and having a bottom end terminating flush with a bottom surface of said sponge;

a generally rectangular plate overlying and completely covering said bottom surface of said sponge, said plate centrally secured to said bottom end of said shank member;

said plate having a concave bottom surface;

said plate having a pair of upwardly extending side walls partially overlying opposite side faces of said sponge; and

said side walls of said plate having outwardly curved bottom edges, intersecting said bottom surface and forming a pair of parallel opposed scraping edges.

4,944,319

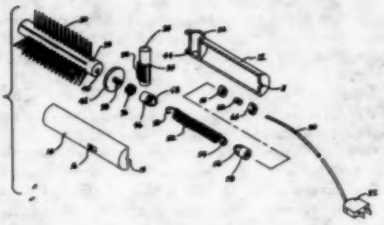
HAIR STYLING DEVICE

Ken Trombley, 5613 No. 52nd St., Tacoma, Wash. 98407

Filed Dec. 9, 1988, Ser. No. 282,306

Int. Cl.[5] A45D *2/36, 2/12*

U.S. Cl. 132—238 **2 Claims**



1. A hair styling device, comprising:

an elongated housing having first and second opposite ends;

a circular opening adjacent said first end of said housing;

a circular undercut groove in said housing adjacent said circular opening;

a circular disk covering said circular opening and rotationally mounted in said groove;

an externally threaded stud having a central bore and extending centrally through said disk;

an elongated brush secured to an outer side of said disk, by said stud, said brush having an internal electrical heating element;

a pinion gear coaxially secured to an inner side of said disk by said stud, said pinion gear having a central longitudinal aperture in registry with said central bore of said stud;

a first ring nut having a central threaded longitudinal bore threadably secured to said stud;

an elongated coil spring extending longitudinally within said housing and having a first end loop secured to said first ring nut;

a second ring nut fixed adjacent said second housing end;

said second ring nut having a central longitudinal bore aligned with an aperture formed through said second housing end;

a transversely extending well formed adjacent said first housing end;

a push button received for transverse reciprocal sliding movement in said well;

a gear rack on said push button engaging said pinion gear; and

a power cord extending sequentially through said aperture in said second housing end, said second ring nut, said coil spring, said first ring nut, said pinion gear, said pinion stud, said disk and connected with said internal heating element.

4,944,320

CHEMICAL CONTROL OF ROOT GROWTH IN SEWERS AND THE LIKE

Diana H. Waite, Marysville, Mont.; Nathan H. Chance, Jr., Visalia, and Robert A. Edmiston, Fresno, both of Calif., assignors to Airrigation Engineering Co., Inc., San Jose, Calif.

Continuation of Ser. No. 353,953, Jun. 9, 1987, abandoned, which is a division of Ser. No. 59,930, Jun. 9, 1987, abandoned. This application Oct. 18, 1989, Ser. No. 423,687

Int. Cl.[5] B08B *9/04*

U.S. Cl. 134—167 C **4 Claims**

1. A system for coating with clinging foam the upper portion of the interior walls of a generally horizontal pipe comprising:

separate sources for water, foam-producing solution, and atmospheric air,

a high-pressure pump connected to said source of water and

to a first downstream conduit for water under high pressure,

first lower-pressure pump and metering means connected to said source of water and to a second downstream conduit for supplying water in metered amounts to said second downstream conduit,

second pump and metering means connected to said source of foam-producing solution and to said second downstream conduit, for supplying and metering said foam producing solution to said second downstream conduit,

a compressor connected to said source of air and to said second downstream conduit,

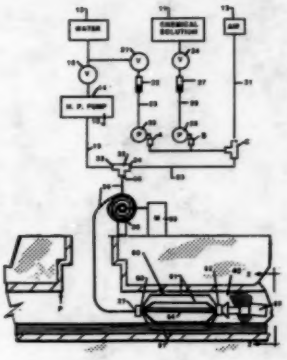
whereby metered amounts of water, foam-producing solution, and air can be combined into a damp sloppy foam that is fed to said second downstream conduit,

a three-way valve with two inlets, one connected to each of said first and second downstream conduits and having an outlet,

a long hose connected at an inlet end to said valve outlet and having an outlet end and wherein said damp sloppy foam is worked into a clinging foam, said hose being adapted to extend into the pipe to be interiorly coated with foam,

reeling means for reeling said hose and for enabling it to unreel freely,

skid means having a central pipe connected to said outlet end of said hose and having a series of skid rods regularly



spaced around said central pipe so that at any time two of said skid rods engage the bottom part of the wall of the pipe to be coated,

a nozzle connected to said skid's central pipe and supported by said skid, said nozzle comprising a body divided by pressure actuated valve means into a first chamber adjacent to said hose and having a series of high-pressure jet exits and a second chamber having a foam outlet, said valve means normally connecting said second chamber to said hose but, when the water from the hose is under high pressure, closing off said second chamber so that the water exits via said jet exits from said first chamber, and

gravity-operated outlet means connected to the foam outlet from said nozzle's second chamber, for enabling expulsion of said foam toward the walls of said pipe lying along a predetermined sector only and preventing expulsion toward the bottom portion of said pipe walls,

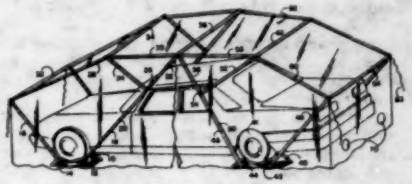
whereby in operation, said high-pressure pump sends water into said nozzle at high pressure to cause closure of said valve means and exit of said water from said first chamber through said jet exits, to jet said nozzle along said pipe to a desired position, while unreeling said hose, then, with said high-pressure pump de-activated, with consequent opening of said nozzle's valve means, said first and second pump and metering means and said compressor are actuated to supply said second downstream conduit with a foamed predetermined mixture of water foaming solution, and air to supply sloppy foam to the three-way valve while the hose is reeled in, so that clinging foam is impinged against the upper portion of said pipe walls.

4,944,321

PORTABLE VEHICLE GARAGE AND TENT STRUCTURE

Francisco Moyet-Ortiz, Valle Tolimas, Calle 11 N-17, Caguas, P.R. 00625

Filed Feb. 2, 1990, Ser. No. 473,732
Int. Cl.[5] E04H *15/06*
U.S. Cl. 135—88 **14 Claims**



1. A structure useful as a cover in a first mode for a four-wheeled vehicle having a front and rear and as a tent in a second mode, comprising:

first, second, third and fourth support members, each having a front and rear, each positioned respectively under a wheel of said vehicle retaining such support members to the ground with said first and second support member disposed under the front wheels of said vehicle and said third and fourth support members disposed under the rear wheels of said vehicle;

a first pole support receipt means positioned in the front of each of said support members;

a second pole support receipt means positioned in the rear of each of said support members;

first and second front support poles having a top and bottom with the bottom of each affixed respectively to the first pole support receipt means of said first and second support members disposed under the front wheels of said vehicle, said first and second front support poles extending upward and forward with respect to said vehicle;

first and second front central poles having a top and bottom with the bottom of each affixed respectively to the second pole receipt means on said first and second support members disposed under the front wheels of said vehicle, said first and second front central poles extending upward and rearward with respect to said vehicle;

first and second rear support poles having a top and bottom with the bottom of each affixed to said second pole receipt means respectively of said third and fourth support members under the rear wheels of said vehicle, said first and second rear support pole extending upward and rearward with respect to said vehicle;

first and second rear central poles, each having a top and bottom with the bottom of each affixed to said first pole receipt means, respectively, of said third and fourth support members, said first and second rear central pole extending upward and forward with respect to said vehicle and attached at their tops to the tops of said first and second front central pole, respectively, on each side of said vehicle;

a central cross member interconnecting the tops of said attached first and second front central poles and said first and second rear central poles;

first and second middle support poles, each having a top and bottom with their bottoms angularly adjustably attached respectively to said first and second front central pole, said front middle support poles extending forward and upward with respect to said vehicle;

first and second upper front support poles extending from

the tops of said first and second front support poles to the tops of said first and second front middle support poles, respectively;

first and second top front support poles extending from the tops of said first and second middle support poles, respectively, to the junction of said first and second front central poles and said first and second rear central poles at said central cross member;

first and second rear middle support poles, each having a top and bottom with their bottoms angularly adjustably attached respectively to said first and second rear central poles, said first and second rear middle support poles extending rearward and upward with respect to said vehicle;

first and second upper rear support poles extending respectively from the tops of said first and second rear support poles to the tops of said first and second rear middle support poles;

first and second top rear support poles extending from the tops of said first and second front middle support poles to the junction of the tops of said first and second front and rear central poles;

a front middle cross member extending from the top of said first front middle support pole over to said second front middle support pole;

a rear middle cross member extending from the top of said first rear middle support pole to said second rear middle support pole;

a front cross member extending from the top of said first front support pole to said second front support pole;

a rear cross member extending from said first rear support pole to said second rear support pole; and

covering extending over the structure of support poles and cross member to cover said structure.

4,944,322

FOLDABLE TENT

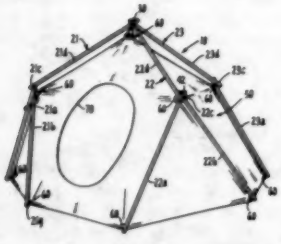
Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95001

Filed Oct. 24, 1988, Ser. No. 261,349

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[5] E04H *15/42*

U.S. Cl. 135—105 **2 Claims**



1. A foldable tent structure comprising:

a plurality of pole clusters

each of said pole clusters having three poles which form an inverted Y-shape, said three poles being connected to each other by connecting means at the center of said inverted Y, the poles forming the two arms of each inverted Y-shape cluster extending to the ground and the poles forming the stems of each inverted Y-shape cluster extend upwardly and being connected to each other at the top of the structure

the stem of each Y-shape cluster being adapted to articulate about the center of said inverted Y, so that in the folded position, the top of the tent is adjacent the lower ends of said arms, and

a foldable membrane connected to both ends of each pole of each of said pole clusters by clip means, whereby said foldable tent structure may be assembled and disassembled repeatedly without separating said foldable membrane from said poles.

4,944,323

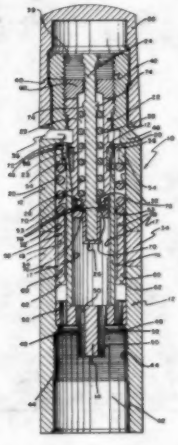
TIRE PRESSURE INDICATOR

Alan Bartholomew, Newton, and Jack J. Williams, Great Bend, both of Kans., assignors to Wagnon Power Jack, Inc., Great Bend, Kans.

Filed Dec. 16, 1987, Ser. No. 133,613

Int. Cl.[5] F16K *37/00*

U.S. Cl. 137—227 **16 Claims**



1. A visual tire pressure indicator comprising an outer body having a structure defining an inner wall, a transparent outer body section, a vent aperture, a top opening internally lined with top threads and a bottom opening internally lined with bottom threads;

an inner cap fitted against the inner wall of the outer body and having at least one air inlet aperture wherethrough air is emitted and at least one air outlet aperture wherethrough air passes;

an inner body having an outer wall, an inner wall, and secured to said inner cap;

an indicator sleeve means slidably disposed around said inner body;

a calibrated spring means helically surrounding said inner body and contacting a top end of said indicator sleeve means for biasing said indicator sleeve means towards said inner cap;

a valve core body threadably engaged to the top threads and fitted against the inner wall of the inner body, said valve core body having a structure defining a longitudinal bore;

an air flow control rod slidably disposed in said longitudinal bore;

a valve core cap secured to said air flow control rod; and

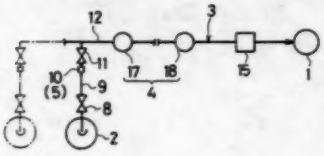
a valve core spring means disposed around said air flow control rod and in said longitudinal bore for biasing said valve core cap against the valve core body.

4,944,324

FUEL GAS SUPPLY EQUIPMENT WITH ABNORMAL OFFENSIVE ODOR SUPPRESSING FILTER

Hideo Kajino, Tokyo, and Kazuo Matsuo, Sapporo, both of Japan, assignors to Iwatani Sangyo Kabushiki Kaisha and Central Sekiyu Gas Kabushiki Kaisha, both of, Japan

Filed Apr. 3, 1989, Ser. No. 331,973
Claims priority, application Japan, Aug. 31, 1988, 63-115454
Int. Cl.[5] F17C 7/02
U.S. Cl. 137—113 11 Claims



1. A gas supply system, having a gas container for containing a liquefied petroleum gas mixed with an odorous substance to facilitate detection of gas leakage, a gas supply passage and a pressure regulating means, the gas supply passage being arranged from a gas outlet of the gas container to a gas inlet of a gas burner and being provided with the pressure regulating means, comprising:

a filter-mounting portion of the gas supply passage disposed on the upstream side of the pressure regulating means; and

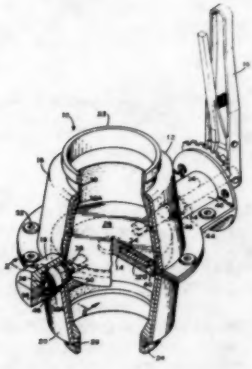
a cotton-like filter disposed in said filter-mounting portion to suppress an outflow of an abnormal quantity of said odorous substance, a gas inlet of the filter-mounting portion and a gas outlet thereof being intercommunicated through said cotton-like filter.

4,944,325

BUTTERFLY VALVE FOR EROSIVE FLUID STREAMS

Stanley L. Baldwin, Winnipeg, and Charles W. Berscheid, Manitoba, both of Canada, assignors to INCO Limited, Toronto, Canada

Filed Oct. 16, 1989, Ser. No. 422,945
Claims priority, application Canada, Nov. 29, 1988, 584475
Int. Cl.[5] F16K 51/00
U.S. Cl. 137—375 4 Claims



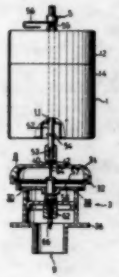
1. An erosive fluid butterfly valve, the valve comprising a housing formed by two flanged frustoconical body segments joined at their widest ends, the widest ends when joined defining a maximum internal diameter plane, the body segments including two opposed extensions that form first and second support cavities coincident with the maximum internal diameter plane, an access port disposed at the opposed end of each body segment, a rotatable disc disposed within the housing, the disc including opposed shafts extending into the first and second support cavities, split bushings disposed about the shafts in the first and second support cavities, erosion resistant liner material enveloping the disc and the interior of the housing and forming a sealable relationship therebetween, the liner material extending into the support cavities, and means for rotating the disc.

4,944,326

INLET VALVE FOR WATER TANKS

Su Yueh Hsieh, No. 126, Hsi Lu St., Hsi Lu Li, Tien Chung Chen, Chang Hua Hsien, Taiwan

Filed Sep. 8, 1989, Ser. No. 404,458
Int. Cl.[5] F16K 31/34, 33/00
U.S. Cl. 137—414 3 Claims



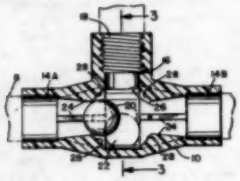
1. An inlet valve for a water tank comprising a float having a hole extending in a longitudinal direction; a housing being disposed below said float, said housing including a casing, a cap being provided on a top end of said casing, and a connector being provided at a lower end for connecting to a water supply; an inlet and an outlet being formed in said casing, said inlet being formed in a lower center portion of said casing and said outlet communicating between an interior of said casing and said water tank; a center hole with at least one lateral hole being formed in a center of said cap, said lateral hole and said center hole, normally providing communication between said water tank and an interior of the cap; and a control device extending through said hole of said float, said center hole of said cap and said inlet of said casing; said float being movable up and down relative to said control device; said control device including means to block and open said lateral hole of said cap as the float moves up and down; a block element connected to a lower end of said control device and being actuated to block and release said inlet of said casing as the float moves up and down; means pushing said block element downward after said lateral hole is blocked; and a float level adjusting mechanism provided at an upper end of said control device wherein said adjusting mechanism comprises a coil spring coiled around a portion of the control device and having two ends extending from the coil spring as handles such that when the ends are squeezed together the coil spring is then freely movable with respect to the control device whereby when said handles are released said coil spring will become set at a selective position for adjusting an upper limit of said float relative to said control device for adjusting a water level in the tank.

4,944,327

RISER CHECK VALVE

Christopher J. Gyben, 9751 Canyon Country La., Escondido, Calif. 92026

Filed Oct. 4, 1989, Ser. No. 417,190
Int. Cl.[5] F16K *17/24*
U.S. Cl. 137—519.5 **12 Claims**



1. A fluid check valve comprising:

(a) a housing defining a first, generally horizontal fluid channel and a second, generally vertical fluid channel joining the first channel and in fluid communication therewith, the junction of the first and second channels defining a mouth through which fluid passes from the first channel into the second channel,

(b) a sphere disposed in the first channel below the mouth for closing said mouth, the size of the sphere and the shape of the mouth being such that the sphere substantially closes the mouth when the sphere is pressed against the mouth,

(c) means for confining movement of the sphere in the first channel to a volume space directly below the mouth,

(d) the mass of the sphere being large enough for the force of gravity acting upon the sphere to prevent the sphere from closing the mouth when fluid is flowing through both channels and the rate of fluid flow from the first channel into the second channel is restricted generally below a threshold rate, but the mass of the sphere being small enough to allow the sphere to close said mouth when the rate of said fluid flow is generally beyond the threshold rate.

4,944,328

SOLENOID CONTROLLED VALVE

Robert W. Brundage, 135 Paradise Rd., Painesville, Ohio 44077

Continuation of Ser. No. 58,644, Jun. 2, 1987, Pat. No. 4,791,958, which is a continuation of Ser. No. 563,760, Dec. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 378,133, May 14, 1982, abandoned. This application Dec. 16, 1988, Ser. No. 285,720
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[5] F16K *31/06*; G05D *7/06*
U.S. Cl. 137—528 **15 Claims**

1. An electrically controlled pressure relief valve comprising:

(a) a housing having a cylindrical cavity and a pressure inlet communicating with a valve seat;

(b) a moveable valve element having a valve seat engaging surface;

(c) a magnetically permeable armature movable in said cavity and adapted to create a force biasing the valve element towards engagement with the valve seat;

(d) a solenoid including:

(i) a solenoid coil;

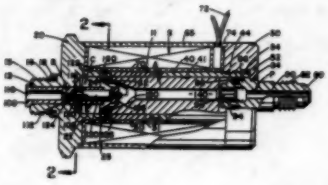
(ii) an armature attracting annular pole piece adjacent to the valve seat; and

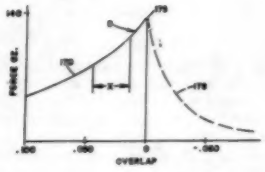
(iii) an armature supporting annular pole piece remote from the valve seat and axially spaced from the attracting pole piece;

(e) said armature including:

(i) one armature portion remote from the valve seat substantially overlapping the supporting pole piece; and

(ii) another armature portion located near to the valve seat and positioned to slightly overlap a cavity forming end portion of the attracting pole piece;





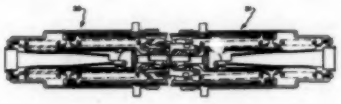
(f) operating means for causing a magnetic biasing force exerted on said armature by said solenoid to rise substantially as the valve element moves away from engagement with the valve seat, the rate of rise being greater at higher solenoid energization.

4,944,329

AUTOMATICALLY-OPERATED REDUNDANT-TYPE FLUID COUPLING DEVICE

Joseph M. Cardin, Buffalo, N.Y.; Raoul Fremy, Courcouronnes, France, and Patrick K. Griffin, Cowlesville, N.Y., assignors to Moog Inc., East Aurora, N.Y., a part interest

PCT No. PCT/US88/01778, § 371 Date Nov. 8, 1989, § 102(e) Date Nov. 8, 1989, PCT Pub. No. WO89/01587, PCT Pub. Date Feb. 23, 1989
PCT Filed May 26, 1988, Ser. No. 455,449
Int. Cl.[5] F16L *29/00*
U.S. Cl. 137—614.05 **17 Claims**



1. In a coupling section having an elongated body provided with a flow passageway therethrough, and having actuating member mounted for movement relative to said body between two extreme positions, the improvement which comprises:

at least two valve elements operatively arranged in said passageway, each of said elements being mounted for rotation between a flow-preventing position and a flow-permitting position, each of said elements being in said flow-preventing position when said actuating member is in one of said extreme positions and being in said flow-permitting position when said actuating member is in the other of said extreme positions; and

an actuating mechanism for selectively rotating said valve elements sequentially between their flow-preventing positions and their flow-permitting positions when said actuat-

ing member is moved from said one extreme position to said other extreme position;

whereby, when said actuating member is in said one extreme position, said valve elements will redundantly close said flow passageway.

4,944,330

DISK TYPE VALVE

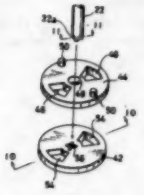
Kohei Sakakibara; Kanetaro Masuoka, and Toshio Fukushima, all of Tokoname, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed Jul. 7, 1989, Ser. No. 376,997

Claims priority, application Japan, Jul. 22, 1988, 63-182935; May 26, 1989, 1-61451

Int. Cl.[5] F16K *3/08*

U.S. Cl. 137—625.31 **6 Claims**



1. A disk type valve comprising:

a cylindrical valve casing having an end portion and a side opening to allow fluid to pass from the end portion to the side opening,

a fixed disk immovably situated inside the casing adjacent the side opening to orient perpendicular to a central axis of the casing, said fixed disk having a central hole and at least one opening,

a movable disk rotationally situated inside the basing adjacent the fixed disk at a side of the end portion to orient parallel to the fixed disk, said movable disk having an opening and a cross-shaped recess in the center thereof,

means for supporting the movable disk without pressing the movable disk, said supporting means being attached to the casing under the movable disk, and

a spindle having a cross-shaped distal end, said spindle passing through the central hole of the fixed disk and engaging the cross-shaped recess of the movable disk so that when the opening of the movable disk communicates the opening of the fixed disk by turning the spindle, water flows from the end portion to the side opening through the openings of the fixed and movable disks.

4,944,331

SOLENOID VALVE

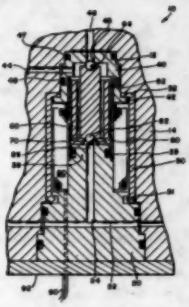
Wendell D. Tackett, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 22, 1989, Ser. No. 371,667

Int. Cl.[5] F15B *13/044*

U.S. Cl. 137—625.65 **7 Claims**

1. A solenoid valve, comprising a body having at a first end at least a first opening and at a second end second and third openings, the first end including a base member containing said first opening which extends laterally and communicates with a longitudinal opening extending in said base member, an armature disposed movably between said base member and said second end, the armature comprising a longitudinal member having a first valve which may sealingly engage the longitudinal opening of the base member and a second valve which sealingly engages the third opening, a pair of parallel axial passages extending through the armature in order to permit fluid flow through the armature, a wave washer disposed between said armature and base member and biasing said armature so that the second valve normally engages sealingly the third opening, the base member and second end of the body defining therebetween a chamber which houses said armature, the second and third openings communicating with said chamber, and coil means disposed about said armature and for effecting displacement of said armature, so that energization of



said coil means causes said armature to be displaced such that the second valve opens said third opening and said first valve sealingly engages said longitudinal opening and subsequent energization of the coil means in combination with fluid pressure received at the first opening causes said armature to modulate the valves between open and closed positions.

4,944,332

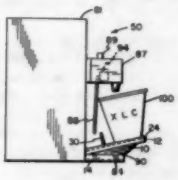
BEVERAGE DISPENSER FOR FILLING CUPS AND EXTRA-LARGE RECEPTACLES WITH AUTOMATIC DISPENSING SHUT OFF

Terrance G. Beiland, Champlin, Minn., assignor to The Cornelius Company, Anoka, Minn.

Continuation-in-part of Ser. No. 880,464, Jun. 30, 1986, Pat. No. 4,738,285. This application Sep. 14, 1987, Ser. No. 96,983

Int. Cl.[5] B65B *3/04*

U.S. Cl. 141—1 **25 Claims**



14. A method of dispensing beverage from a single dispenser into any beverage receptacle selected from a predetermined group of standard sized beverage cups and at least one extra large beverage receptacle which is of greater size and capacity than any of the cups and which has a fluid capacity of at least one quart, with unattended automatic shut off of dispensing when dispensed beverage reaches or approaches the rim of the selected receptacle regardless of which of the group the selected receptacle is, comprising the steps of

(a) selecting any one receptacle from said receptacle group and placing the selected receptacle upon a rearwardly inclined receptacle support surface and tilting the selected receptacle to the rear,

(b) moving the rearwardly tilted selected receptacle rearward and downward upon the rearwardly inclined support surface and into physical contact with an electrically conductive beverage level probe;

(c) starting dispensing of beverage into said selected receptacle;

(d) electrically sensing the dispensed beverage with the probe as the dispensed beverage level in the selected receptacle reaches or approaches an upper rim of the selected receptacle and touches the probe;

(e) automatically terminating dispensing upon such sensing; and

(f) completely supporting a base of said selected beverage receptacle during the steps of dispensing and sensing and terminating, said supporting being done above and beyond a footprint of an original cup support upon said dispenser with an enlarged and inclined beverage receptacle support which is extended upward from and outward beyond said footprint for stably physically engaging the base of said selected beverage receptacle beyond said footprint.

4,944,333

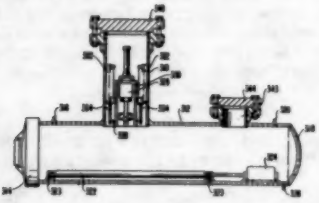
CYLINDER RUPTURE VESSEL WITH CLAMPS FOR IMMOBILIZING A CONTAINER INSIDE THE VESSEL

Jeffrey W. Gold, Atlanta, Ga., and Dan A. Nickens, Orlando, Fla., assignors to Earth Resources Consultants, Inc., Orlando, Fla.

Continuation-in-part of Ser. No. 669,537, Nov. 8, 1984, Pat. No. 4,690,180. This application Jun. 3, 1987, Ser. No. 57,083

Int. Cl.[5] B65B *31/00, 7/24*

U.S. Cl. 141—51 **10 Claims**



1. A cylinder rupture vessel comprising:

an enclosed chamber;

means for gaining access to the interior of the chamber;

a pair of rollers disposed along the elongate length of the chamber adapted to support thereon a target container to be ruptured;

means for sealing the chamber;

drill means disposed within the chamber for puncturing at least one wall of the target container;

clamp means for immobilizing the container on the pair of rollers;

at least two inlet purge connections communicating with the interior of the chamber and adapted to purge the gases therein;

at least one vacuum connection communicating with the interior of the chamber and adapted to evacuate the gases therein and the gases released into the chamber by the punctured target container; and

at least one drainage port communicating with the interior of the chamber and adapted to drain from the chamber the liquids released by the punctured target container.

4,944,334

VIBRATING HOPPER AND AUGER FEED ASSEMBLY

Harold R. McGregor, 1444 Lincoln Ave., Owatonna, Minn. 55060

Filed Nov. 14, 1988, Ser. No. 270,845

Int. Cl.[5] B65B *1/08, 1/12, 1/20*

U.S. Cl. 141—71 **20 Claims**

1. A vibrating hopper and auger feed assembly for use in de-aerating a product, said vibrating hopper and auger feed comprising:

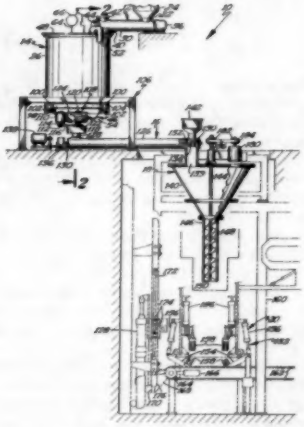
a frame assembly;

a top bin connected to said frame assembly, said top bin defining an interior receptacle region to contain the product, an inlet port, and a generally open bottom;

a bottom hopper, said bottom hopper being connected to and mounted substantially beneath said top bin in fluid communication therewith such that the product in said top bin may flow downwardly into said bottom hopper through said generally open bottom, said bottom hopper defining an outlet port;

an inverted pressure dome, said pressure dome being connected to said bottom hopper and spaced apart generally therefrom such that product may flow between said pressure dome and said bottom hopper, said pressure dome defining a generally enclosed area disposed beneath said pressure dome, said pressure dome further defining an aperture extending therethrough;

an auger shaft, said auger shaft being oriented in a generally vertical direction and extending upwardly from said outlet port of said bottom hopper through said aperture defined in said pressure dome and terminating in a top end thereof disposed above said pressure dome, said auger shaft including a section of flighting, said section of flighting being disposed beneath said pressure dome and extending substantially between said outlet port and said enclosed area disposed beneath said pressure dome;



a vent tube, said vent tube surrounding said auger shaft and defining an air passage therebetween, said air passage of said vent tube communicating with said aperture defined in said pressure dome and with said enclosed area, said vent tube connected to and extending upwardly from said pressure dome in a generally vertical direction and terminating in a top end thereof;

venting means for venting air from said top end of said vent tube to an exterior region surrounding said top bin;

drive means for rotating said auger shaft, said drive means being connected to said auger shaft; and

vibration producing means for vibrating said bottom hopper relative to said frame assembly,

whereby the product is loaded into the top bin and flows downwardly around the inverted pressure dome and into the bottom hopper, the bottom hopper being vibrated by the vibration producing means, the product being compressed to remove excess gasses by the section of flighting as the auger shaft is rotated by the drive means, the product being expelled through the outlet port by said section of flighting with the excess gasses being vented upwardly through the pressure dome and vent tube.

4,944,335

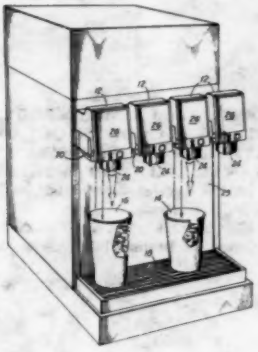
AUTOMATIC CONTROL SYSTEM FOR FILLING BEVERAGE CONTAINERS

William F. Stembridge, College Park, Ga.; James C. Sturrock, Espanola, N. Mex., and W. Frank Stembridge, East Point, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 684,215, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 629,397, Jul. 10, 1984, abandoned. This application May 8, 1987, Ser. No. 48,111

Int. Cl.[5] B65B *3/26*

U.S. Cl. 141—95 **21 Claims**



1. A level sensing system comprising:

ultrasonic sound wave transducer means for emitting ultrasonic sound waves and for receiving ultrasonic sound waves reflected from a receptacle whose content level is to be sensed;

a content level detector, responsive to said reflected ultrasonic sound waves, for detecting the level of the contents of the receptacle by sensing reflected ultrasonic sound waves having a signal level greater than a first reference level;

a rim detector, responsive to said reflected ultrasonic sound waves, for determining the location of the rim of the receptacle by sensing reflected ultrasonic sound waves having a signal level greater than a second reference level which is different from said first reference level; and

a level comparator, responsive to said rim detector and said content level detector, for comparing the contents level with the rim location for indicating when the contents level is within a predetermined distance of the rim.

4,944,336

AUTOMATIC CONTROL SYSTEM FOR FILLING BEVERAGE CONTAINERS

William F. Stembridge, College Park, Ga.; James C. Sturrock, Espanola, N. Mex., and W. Frank Stembridge, East Point, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 48,111, May 8, 1987, which is a continuation-in-part of Ser. No. 684,215, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 629,397, Jul. 10, 1984, abandoned. This application Nov. 21, 1988, Ser. No. 274,091

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[5] B65B *3/04;* **H04R** *17/00*

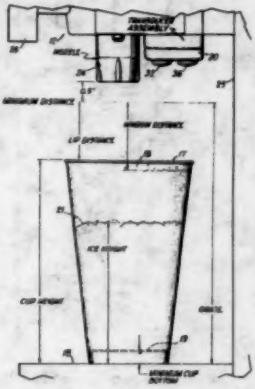
U.S. Cl. 141—95 **3 Claims**

1. A transducer assembly for use in the automatic filling of a container with a beverage comprising:

(a) a housing;

(b) a front pair of separate transmitter and receiver crystals mounted spaced-apart in said housing, each crystal having a lower surface and having a lens connected to the lower surface of the crystal and with the lower surface of each lens being adjacent the bottom of said housing and being exposed to atmosphere;

(c) a rear pair of separate transmitter and receiver crystals mounted spaced-apart in said housing, each crystal having a lower surface and having a lens connected to the lower surface of the crystal and with the lower surface of each lens being adjacent the bottom of said housing and being exposed to atmosphere;



(d) four separate non-ferrous metal tubes being located spaced-apart within said housing in a vertical orientation therein;

(e) each of said crystals of said front pair of crystals and of said rear pair of crystals being located within but not touching one of said four separate non-ferrous metal tubes; and

(f) polyurethane foam substantially filling the remaining space within said housing and within each of said tubes and holding each of said tubes and each of said crystals in place therein.

4,944,337

AUTOMATIC BEVERAGE DISPENSING SYSTEM WITH PLURAL CONVEYORS

William S. Credle, Jr., 1763 E. Gate Trail, Stone Mountain, Ga. 30087; Lawrence B. Ziesel, 531 Stillwaters Dr., Marietta, Ga. 30064, and Mark S. Heflin, 836 Glendale Ter., Atlanta, Ga. 30308

Filed Mar. 29, 1988, Ser. No. 174,742

Int. Cl.[5] B65B *3/04, 43/42*

U.S. Cl. 141—174 **10 Claims**

1. An automatic beverage dispensing system comprising:

(a) a dispenser and a housing for said dispenser;

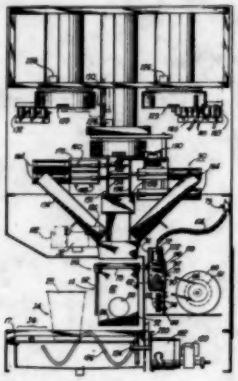
(b) a first conveyor system for conveying cups sideways in said housing from a cup drop station to a transfer station on any one of a plurality of the below-recited second conveyor systems;

(c) a plurality of second conveyor systems for conveying cups forward of said housing from a respective transfer station located adjacent a proximal end of each of said second conveyor system to a beverage fill station located downstream from said transfer station and then to a pick-up station located downstream from said beverage fill station, each of said second conveyor systems including a straight, cup-supporting surface extending back to front in said housing;

(d) an automatic cup dropper assembly including a plurality

of cup holders each adapted to hold a plurality of different size cups, and including means for dropping a cup of the desired size onto said first conveyor system at a cup drop station thereof;

(e) an ice dispenser assembly in said housing including an ice bin and an automatic ice dispenser for dispensing a selected quantity of ice into a cup supported on said first conveyor system at an ice drop station located on said first conveyor system;



(f) a beverage dispensing valve located at said beverage fill station of each of said plurality of second conveyor systems, for dispensing beverage into a cup located at said beverage fill station; and

(g) said second conveyor systems each including means for conveying filled cups from said fill station forward to said pick-up station.

4,944,338

BARKING METHOD, AND AN APPARATUS FOR UTILIZATION OF THE METHOD

Kjell-Anders Eriksson, Fiskgatan 10, Leksand, Sweden S-793 00

PCT No. PCT/SE87/00154, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO87/05851, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 25, 1987, Ser. No. 252,455

Claims priority, application Sweden, Mar. 27, 1986, 86014495

Int. Cl.[5] B27L *1/00*

U.S. Cl. 144—208 E **17 Claims**

1. In a barking apparatus wherein a log is moved in a substantially linear feeding direction in the direction of its longitudinal axis through a barking means rotating around the log and urged into engagement with the periphery of the log by centrifugal force, the improvement comprising:

a rotating member;

an opening through said rotating member for receiving the log therethrough;

at least one barking device movably mounted on said rotating member for rotation therewith and projecting into said opening for engagement with the peripheral surface of the log;

centrifugal force operated means operatively connected to said at least one barking device for controlling the contacting pressure of said barking device against the peripheral surface of the log proportionally to the speed of rotation of said rotating member; and

co-acting means operatively associated with said barking device to positively cause disengagement of said barking device at predetermined rotating speeds of said rotating member.

4,944,339

PROCEDURE FOR MACHINING WOODEN ARTICLES, INSTALLATION FOR CARRYING OUT A PROCEDURE OF THIS TYPE AND CLAMPING BENCH TO BE USED IN AN INSTALLATION OF THIS TYPE

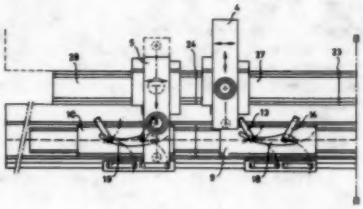
Jacobus H. Luyten, Tegelen, Netherlands, assignor to Helma Tegelen B. V., Netherlands

Filed Mar. 29, 1989, Ser. No. 329,951

Claims priority, application Netherlands, Mar. 30, 1988, 8800814

Int. Cl.[5] B27B *1/00*; B27C *5/00*

U.S. Cl. 144—363 **15 Claims**



1. Apparatus for machining one or more wooden articles from an initial shape to a final shape at a plurality of machining operation stations comprising:

a plurality of clamping benches, each so said benches being respectively adapted to support a wooden article to be machined and including at least one first clamping device mounted thereon for fixedly clamping its respective wooden article;

a conveyor arrangement for supporting said plurality of clamping benches and moving them along a predetermined path past said plurality of machining operation stations so that the wooden article supported on each clamping bench can be machined at each machining operation station in sequence;

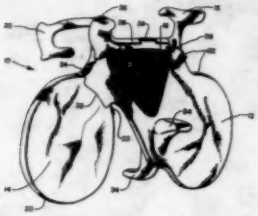
a plurality of second clamping devices, at least one of said second clamping devices being respectively mounted at each of said plurality of machining operation stations and being adapted to fixedly clamp said wooden article mounted on said clamping bench when each clamping bench reaches its respective machining operation station whereby said wooden article remains fixedly mounted on its respective clamping bench until all of the machining operations to be carried out on said article from its initial shape to its final shape have been completed, said first clamping devices being used to support said wooden article at least during movement of said clamping benches between stations.

4,944,340

AERODYNAMIC BICYCLE COVER

Rainey Tortorich, 1755 Whispering Oaks, Ogden, Utah 84403

Filed Sep. 21, 1989, Ser. No. 410,648
Int. Cl.[5] B60R 9/10
U.S. Cl. 150—167 20 Claims



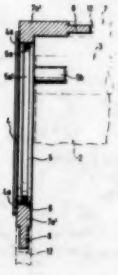
1. An aerodynamic cover for a wheeled vehicle comprising:
a structure of flexible material configured such that when in place over the wheeled vehicle it conforms generally to the outside silhouette of the wheeled vehicle;
means for allowing placement of said wheeled vehicle within the structure of flexible material;
means for securing the flexible structure about the wheeled vehicle such that the structure and the wheeled vehicle are generally aerodynamic; and
at least one opening disposed through the cover and configured such that when a wheeled vehicle is placed within the cover, a sufficient quantity of air is capable of flowing through the cover such that the wheeled vehicle is capable of being transported on the outside of a motor vehicle, with the flapping of the cover being minimized.

4,944,341

INSULATING GLASS WINDOW WITH LIGHT GUARD

Edmund Trippner, Grüntenweg 9, D-7440 Reudern, and Heinz Thierer, Steiglesäcker 9, D-7312 Kirchheim/Teck, both of Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,555
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806648
Int. Cl.[5] A47H 1/00
U.S. Cl. 160—98 5 Claims



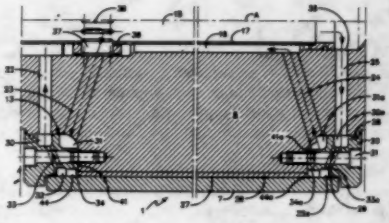
1. In an insulating glass window with two panes separate from each other by means of a sectional frame serving as a spacing member, a space being defined between the panes, the window further including a replaceable light guard device, the light guard device including a shutter with a light guard sheet, the sheet being movable in the space between the panes, and an electric motor for driving the light guard device, the entire light guard device being arranged in the space between the panes, the sectional frame having opposite frame sides extending transversely of the direction of movement of the light guard sheet, the light guard device being supported by the opposite frame sides, wherein the improvement comprises that at least one of the frame sides has an opening for the assembly and disassembly of the light guard device, and a cover for closing the opening in a gas-tight manner.

4,944,342

PROCESS AND DEVICE FOR COOLING ROLLERS

Wilhelm F. Lauener, Gerlafingen, Switzerland, assignor to Lauener Engineering AG, Thun, Switzerland

PCT No. PCT/CH87/00171, § 371 Date Aug. 22, 1988, § 102(e) Date Aug. 22, 1988, PCT Pub. No. WO88/04585, PCT Pub. Date Jun. 30, 1988
Continuation of Ser. No. 251,708, Aug. 22, 1988, abandoned.
This PCT application Dec. 14, 1987, Ser. No. 428,486
Claims priority, application Switzerland, Dec. 22, 1986, 05132/86
Int. Cl.[5] B22D 11/124
U.S. Cl. 164—485 21 Claims



16. A continuous casting roll apparatus having a roller core substantially surrounded in length and circumference by a roller shell, comprising:
a first and a second end face of said roller core, each of said end faces forming the terminating surface of the cylindrically-shaped roller core,
at least one pair of cooling channels which comprise a first cooling channel and a second cooling channel, said cooling channels consisting of adjacent, axial grooves in the surface of said roller core running parallel to the axis of said roller core from a first end of said roller core to a second end, said cooling channels being enclosed by said shell to enable said cooling channels to conduct coolant between roller shell and roller core;
a central conduit in said roller core, extending from said first end of said roller core axially to a point short of said second end, said conduit comprising an inlet channel and an outlet channel for supplying a coolant to and discharging said coolant from said cooling channels;
branch bores, located in said roller core in fluid communication with and radiating from said central conduit and terminating in said cooling channels, said branch bores comprising first and second inlet bores and first and second outlet bores, said first inlet bore being in fluid communication with said inlet channel to supply said coolant from said inlet channel to said first cooling channel at said first end of said roller core, said first outlet bore being in fluid communication with said first cooling channel at said second end of said roller core to discharge said coolant from said first cooling channel to said outlet channel and said second inlet bore being in fluid communication with said inlet channel to supply said coolant from said inlet channel to said second cooling channel at said second end of said roller core, said second outlet bore being in fluid communication with said second cooling channel at said

first end of said roller core to discharge said coolant from said second cooling channel to said outlet channel.

4,944,343

APPARATUS FOR HEATING FUEL

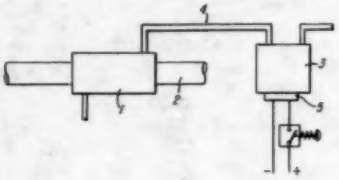
Fritz Müller, Stentenbergstrabe 31, D-5275, Bergneustadt, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,651

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728895; Sep. 1, 1987, 3729112; Sep. 8, 1987, 3730060; Sep. 15, 1987, 3730913; Dec. 5, 1987, 3741281

Int. Cl.[5] F02M *31/10, 31/12, 37/22*

U.S. Cl. 165—47 **2 Claims**



1. An apparatus for heating fuel, especially Diesel fuel and heating oil, that is to be supplied to a unit in which said said fuel is to be atomized and burned, wherein a fuel line leads to said unit through a fuel filter, and a liquid line is provided in which flows liquid that is heated up by said unit; said apparatus comprises:

a heat exchanger disposed upstream of said fuel filter about said fuel line and in said liquid line, whereby said liquid flows through said heat exchanger to heat up said fuel line;

an electrical heating element that is disposed directly on said fuel filter for heating the inner space of the latter; and

switch means provided with said heating element being activated and deactivated in a controlled manner automatically with the aid of a temperature sensor when the temperature of the fuel has fallen below a predetermined temperature at the inlet to or the interior of the fuel filter, said fuel filter having a casing with a bottom that is provided with a water drain opening that is closed off by the threaded end of a drain plug having a longitudinal groove formed on the threaded end of the drain plug so that separated-off water can be drained from the fuel filter without completely removing the drain plug; and disposed in said filter casing is a filter element that leaves free an inner space, with said electrical heating element being in the form of a heating rod that is disposed on said threaded end of said drain plug and is inserted into said inner space; said heating rod having connection leads that extend through said drain plug.

4,944,344

HERMETICALLY SEALED MODULAR ELECTRONIC COLD PLATE UTILIZING REFLUX COOLING

Lawrence E. Crowe, Lindenwood, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 31, 1988, Ser. No. 264,786

Int. Cl.[5] F28D *15/02;* **H01L** *23/42*

U.S. Cl. 165—104.33 **20 Claims**

1. A modular reflux cooling plate for one or more heat generating components, comprising:

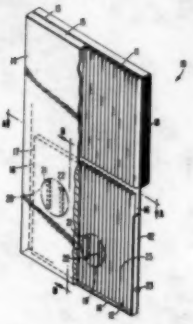
a condensing region;

boiling channels disposed beneath the condensing region;

at least one downcomer in the vicinity of the boiling channels so as to be operatively communicated between the condensing region and the boiling channels; and

end plates hermetically sealing the condensing region, the boiling channels and the at least one downcomer therebetween so that a coolant can be provided in the region of the boiling channels, wherein

the one or more heat generating components are mounted externally on at least one of the end plates adjacent the boiling channels to form an assembly which can be joined



with one or more other modular reflux cooling plates with assemblies thereon for providing heat exchange between heat generating components and the condensing region and the condensing region is provided with lanced offset fins.

4,944,345

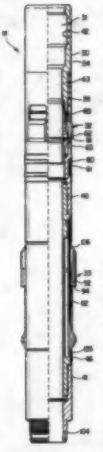
WELL DEVICE LOCK MANDREL AND RUNNING TOOL

Howard R. Mashaw, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 9, 1989, Ser. No. 320,965

Int. Cl.[5] E21B *23/02*

U.S. Cl. 166—206 **20 Claims**



1. A lock mandrel and running tool assembly for setting and locking a well tool-at a selected landing nipple along a well bore comprising:

a lock mandrel having a body provided with side window means and an internal fishneck along an upper end thereof;

radially movable locking dog means in said side window means;

a longitudinally movable expander sleeve in said body movable within said dog means for expanding and locking said dog means and releasing said dog means, said expander sleeve having an internal annular recess for engagement by an operating lug on said running tool to move said sleeve upwardly and downwardly and an external annular

latch boss along an upper end portion thereof for releasably latching said expander sleeve at an upper locking position, said expander sleeve having a longitudinal bore there through having a diameter at least as large as the minimum diameter of the bore through said lock mandrel body;

a latch ring in said body around said expander sleeve above said locking dog means for engagement with said latch boss on said sleeve when said sleeve is at an upper locking position to releasably hold said sleeve in said upper position;

locator key means on said body spaced from said locking dog means having an external defined profile configured to engage an internal locator profile in said selected landing nipple;

longitudinal leaf spring means within said locator key means for holding said locator key means at outward positions for engagement with said selected landing nipple and permitting said locator key means to move inwardly to pass through landing nipples having an internal profile different from said locator profile on said locator key means; and

a running tool for installing said lock mandrel comprising:

a head assembly including a fishneck;

a latch key assembly for coupling said lock mandrel on said running tool;

mounting means supporting said latch key assembly on said running tool for operation between latch and release modes;

lock mandrel operator lug means for locking and releasing said lock mandrel in a landing nipple;

means mounting said operator lug means on said running tool and coupling said operator lug means with said latch key assembly;

non-weight bearing coupling means and release-lockout means connected between said head assembly and said latch key assembly and said operator lug means for holding said latch key assembly in a running mode latched with said lock mandrel and said lock mandrel in a release mode while installing said lock mandrel; and

said release-lockout means being operable responsive to a downward jar to activate said lockout means for locking said lock mandrel in a landing nipple and for release of said latch key means from said lock mandrel for retrieving said running tool.

4,944,346

ETHER SULFOXIDE COMPOUNDS FOR ENHANCED OIL RECOVERY

Roger A. Grey; Lawrence J. Karas, both of West Chester, Pa., and Linda A. Verkruyse, Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 11, 1989, Ser. No. 448,388
Int. Cl.[5] E21B *43/22*
U.S. Cl. 166—274 **7 Claims**

1. A process for recovering crude oil under high salinity conditions from a subterranean formation having at least one injection means in fluid communication with at least one production means comprising:

(a) injecting into said formation a liquid composition consisting essentially of at least one surfactant selected from surfactants having a formula

$$R^1O(R^2O)_x(R^3O)_y(CH)_zS(=O)R^4$$
$$\quad\quad\quad

well annulus defined between said tubing string and said well bore, comprising:

an upper packer means for sealing between said tubing string and said well bore to divide said well annulus into an upper well annulus and a lower well annulus above and below said upper packer means, respectively;

a crossover setting tool, operably associated with said upper packer means, including crossover valve means for permitting reverse circulation of fluid up through said tubing string during running in of said tubing string and said gravel packing assembly into said well, said setting tool also including a downward extending wash pipe initially communicated with said tubing string;

a screen located below said upper packer means and having said wash pipe extending downwardly therethrough; and

a wash pipe extension means, located below said screen, for permitting reverse circulation of sand fill out of said sump packer bore up through said wash pipe and said tubing string.

20. A method Of gravel packing a well comprising the steps of:

(a) supporting from a tubing string a gravel packing assembly including a permanent production packer, a screen located below said packer, and a setting tool associated with said packer and having a wash pipe extending down through said screen;

(b) running said tubing string and said gravel packing assembly into said well until a sand fill is encountered;

(c) reverse washing said sand fill up through said wash pipe and said tubing string;

(d) running said tubing string and said gravel packing assembly further into said well until said gravel packing assembly is located at a selected location in said well;

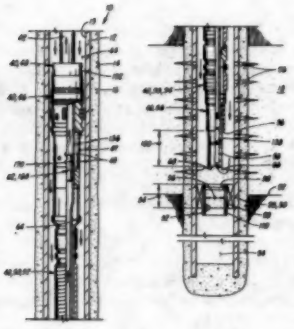
(e) setting said permanent production packer within said well to define an upper well annulus and a lower well annulus;

(f) communicating said tubing string with said lower well annulus and said wash pipe with said upper well annulus;

(g) raising said wash pipe relative to said screen with said permanent production packer and said screen fixed in place in said well to communicate said wash pipe with an interior of said screen;

(h) gravel packing said lower annulus of said well around said screen; and

(i) removing said tubing string and said setting tool from said well leaving said permanent production packer and said screen in place in said well.

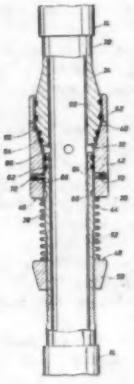


4,944,349

COMBINATION DOWNHOLE TUBING CIRCULATING VALVE AND FLUID UNLOADER AND METHOD

William D. Von Gonten, Jr., 1111 Fannin, Suite 1500, Houston, Tex. 77002

Filed Feb. 27, 1989, Ser. No. 316,159
Int. Cl.[5] E21B 37/00
U.S. Cl. 166—304 17 Claims



1. A downhole fluid circulating and unloading valve comprising:

a tubular member adapted for connection in a tubing string disposable within a well bore that is closed to downward flow of fluid at a point below said tubular member, said tubular member having a port in the wall thereof for passage of fluid out of said tubular member;

a sliding sleeve disposed around the outside surface of said tubular member and having a port in the wall thereof for passage of fluid into the annulus between the tubing string and the well bore;

means for biasing said sliding sleeve toward a first, closed position preventing the passage of fluid out of the port in the wall of said tubular member through the port in the wall of said sliding sleeve;

means on said sliding sleeve responsive to an increase in the pressure of the fluid in said tubular member for shifting said sliding sleeve relative to said tubular member and against said biasing means from said first position to a second, open position in which the port in the wall of said tubular member is in fluid communication with the port in the wall of said sliding sleeve to allow fluid to pass out of the port in the wall of said tubular member and through the port in the wall of said sliding sleeve, and then, in response to a further increase in the pressure of the fluid in said tubular member, from said second position to a third, unloading position in which the port in the wall of said tubular member is also in fluid communication with the port in the wall of said sliding sleeve; and

means for locking said sliding sleeve in said third position to allow fluid to drain from within said tubular member into the annulus without regard to the decrease in the pressure of the fluid which occurs as fluid drains from said tubular member.

12. A method of removing the paraffin from a tubing string in a well having a circulating valve with a sliding sleeve connected therein and then draining the tubing string comprising:

filling the tubing string in the well with a paraffin-removing fluid;

increasing the pressure of the fluid in the tubing string to a first selected pressure to shift the sliding sleeve of the circulating valve connected therein from a first, closed position to a second, circulating position in which the

circulating valve is opened to allow passage of fluid into the annulus outside the tubing string;

increasing the pressure of the fluid in the tubing string to a second selected pressure to shift the circulating valve from the second position to a third, unloading position in which the circulating valve is also open to allow passage of fluid therethrough and locked in the third position; and

draining the fluid from the tubing string and into the annulus through the circulating valve.

4,944,350

TOOL FOR CLOSING A WELL TUBING

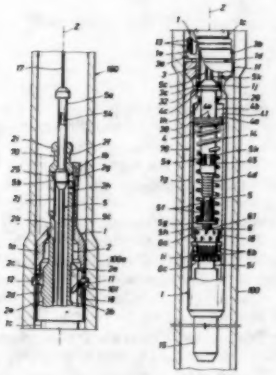
Peter Airey, Vulaines-Sur-Seine, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 99,683, Sep. 17, 1987, Pat. No. 4,756,372, which is a continuation of Ser. No. 918,467, Oct. 14, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 147,077

Claims priority, application France, Oct. 18, 1985, 85 15490

Int. Cl.[5] E21B *34/14*

U.S. Cl. 166—373 **5 Claims**



1. A tool adapted to be suspended by an apparatus in a tubing containing fluid under pressure, comprising: a valve element connected to said apparatus, an upward force adapted to be applied to said apparatus by an operator during suspension of said tool by said apparatus in said tubing;

a valve seat adapted for contacting said valve element, said valve element moving into engagement with said valve seat when said upward force being applied to said apparatus is reduced; and

sealing means connected to said valve seat for sealing said tool to said tubing thereby isolating a top part in said tubing above said sealing means from a bottom part in said tubing below said sealing means when said valve element moves into engagement with said valve seat.

5. A method of operating a valve in a tool adapted to be disposed in a tubing containing fluid under pressure, said valve including a first piston; a second piston connected to said valve element, surrounding said first piston, and defining a first chamber between the first piston and the second piston, a hydraulic fluid being disposed in said first chamber, a port being disposed through said second piston; and a tube disposed around and sealingly engaging a portion of said second piston, said tube defining a second chamber between the tube and the second piston, a hydraulic fluid being disposed in said second chamber and being communicable with the hydraulic fluid in said first chamber via said port; comprising the steps of:

(a) closing said valve by moving a valve element of said valve into engagement with a valve seat of said valve;

(b) establishing a seal between said tool and said tubing thereby isolating one part of said tubing on one side of said seal from an opposite part of said tubing on the other side of said seal; and

(c) moving said valve element away from said valve seat thereby establishing fluid communication between said one part of said tubing and said opposite part of said tubing, the moving step (c) further including the steps of,

(d) moving said first piston thereby compressing the hydraulic fluid in said first chamber;

(e) flowing a portion of said hydraulic fluid from said first chamber into said second chamber via said port thereby compressing the hydraulic fluid in said second chamber; and

(f) moving said second piston relative to said tube so as to increase a volume of said second chamber in response to the flowing step (e),

said valve element moving away from said valve seat thereby establishing fluid communication between said one part of said tubing and said opposite part of said tubing in response to the moving step (f).

4,944,351

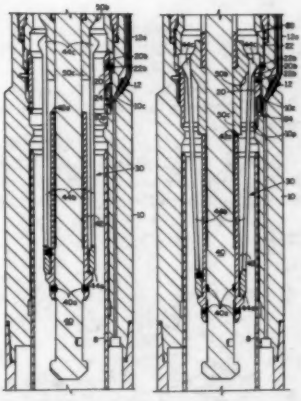
DOWNHOLE SAFETY VALVE FOR SUBTERRANEAN WELL AND METHOD

Erik P. V. Eriksen; Brian K. Drakeley, and Michael A. Carmody, all of Broken Arrow, Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 26, 1989, Ser. No. 426,762

Int. Cl.[5] E21B *34/10, 23/00*

U.S. Cl. 166—376 **12 Claims**



1. The method of establishing communication with a control fluid conduit provided in the tubular wall of a fluid pressure operated downhole tool comprising the steps of:

providing an annular internal shoulder on the inner surface of said tubular wall;

extending a portion of said control fluid conduit into, but not through said shoulder so that the inner end of said extension portion is disposed within the bore of said tubular wall; and

removing said shoulder in its downhole location by an auxiliary tool to expose the bore of said extension portion of said control fluid conduit.

4. Apparatus for effecting the downhole severing of a radially, inwardly directed hollow protuberance on the tubular wall of a valve housing, said tubular wall also defining a no-go shoulder above said protuberance comprising, in combination:

a tool sleeve axially slidably mounted within said tubular wall above said hollow protuberance;

a cutting tool mounted on said tool sleeve in axial alignment with said hollow protuberance;

an outer sleeve assembly having an external shoulder engagable with said no-go shoulder;

an inner sleeve assembly telescopically traversing said outer sleeve;

means on the top end of said inner sleeve for rigid connection to a wireline incorporating a jar mechanism;

a mandrel telescopically inserted through said inner sleeve assembly;

a collet having a ring portion and peripherally spaced, axially extending collet arms terminating in enlarged head portions;

means for securing said collet ring portion to said mandrel with said enlarged head portions disposed above and adjacent to said tool sleeve;

means including an axially extending slot in said inner sleeve for rigidly connecting said outer sleeve and said mandrel;

shearable means for securing said inner sleeve relative to said mandrel and outer sleeve during run-in; and

means on said inner sleeve assembly for radially expanding said collet heads into operative engagement with said tool sleeve, whereby downward jarring movement imparted to said inner sleeve by said wireline shears said shearable means, engages said collet heads with said tool sleeve and moves said cutting tool through said protuberance.

4,944,352

SOD HARVESTER FOR ROLLING SOD WITH GRASS SIDE OUT

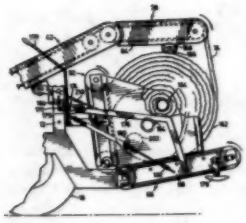
Gerardus J. Brouwer, Keswick, and Henry Zwambag, Sutton, both of Canada, assignors to Brouwer Turf Equipment Limited, Toronto, Canada

Division of Ser. No. 344,771, Apr. 28, 1989, Pat. No. 4,903,778, which is a division of Ser. No. 923,558, Oct. 27, 1986, Pat. No. 4,832,130. This application Dec. 4, 1989, Ser. No. 446,513

Claims priority, application Canada, Oct. 28, 1985, 494053

Int. Cl.[5] A01B *45/04*

U.S. Cl. 172—19 **4 Claims**



1. A sod harvester comprising:

(a) means for undercutting sod,

(b) first conveyor means for conveying cut sod to a raised position and discharging said sod from said raised position,

(c) sod roll forming means located below said raised position,

(d) said sod roll forming means including second conveyor means for forming a roll of sod,

(e) said first and second conveyor means being arranged for rolling said sod to form a said sod roll having its grass side facing outwardly, whereby to facilitate later laying of said sod and to reduce drying of the roots of said sod.

4,944,353

AGRICULTURAL MACHINE

Viktor V. Shishkin; Nikolai F. Kryazhevskikh, and Jury P. Shapovalov, all of Krasnodar, U.S.S.R., assignors to Trest "Juzhvodoprovod" , Krasnodar, U.S.S.R.

PCT No. PCT/SU86/00131, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/03775, PCT Pub. Date Jul. 2, 1987

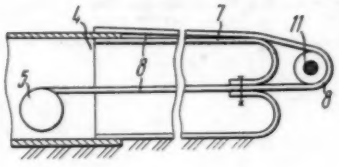
PCT Filed Dec. 17, 1986, Ser. No. 110,716

Claims priority, application U.S.S.R., Dec. 24, 1985, 3988675; Dec. 24, 1985, 3988674

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[5] A01B *51/00*; B25J *11/00*; B62D *57/00*

U.S. Cl. 172—23 **7 Claims**



1. An agricultural machine comprising a self-propelled chassis (1), an attachment carrying a working member (9) with a rod (11) for performing agricultural operations in the field and means (10) for controlling the working member characterized in that the agricultural machine is provided with an arrangement for displacement of the working member (9) over the field surface, comprising a hermetic chamber (3) with a port (4), a source (2) of a fluid agent pumped into the chamber (3) under a pressure, and a first end of a flexible hose (7) wound on a drum (5) and internally accomodating a tractive element (8) on a section of which the tractive element (8) which projects projecting from a free end of the flexible hose (7) mounts is mounted the an attachment carrying the working member (9) and said tractive element (8) is movably connected with the flexible hose (7), while the free a second end of the hose (7) is passed through the chamber (3), turned inside out and hermetically secured in the port (4) of the chamber (3) so that it hose (7) forms an annular space (A) communicating with the latter chamber (3) and by changing its volume under the action of the fluid agent moves the hose (7) over the field and the latter hose (7) pushes in front of itself the attachment carrying the working member (9)

4,944,354

THREE-POINT COUPLING DEVICE

Hans Langen, Frechen; Norbert Fartmann, Siegburg, and Herbert Coenen, Gellenkirchen, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Apr. 6, 1989, Ser. No. 334,454

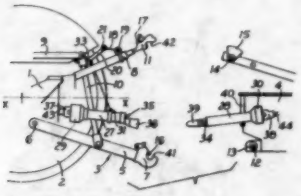
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812198

Int. Cl.[5] A01B *59/06*

U.S. Cl. 172—47 **12 Claims**

1. A three-point coupling device for coupling a tractor to an implement, comprising two lower hitch arms which are articulated at the rear end of the tractor so as to be offset sideways with respect to the longitudinal axis of the tractor and whose free ends have each been provided with a catching hook having a lockable catching jaw which opens upwardly, with each lower hitch arm, via a lifting bar, being connected to a lifting arm movable by the power drive of the tractor; and comprising an upper hitch arm whose one end is articulated at the rear end of the tractor above the lower hitch arms in the region of the longitudinal axis and whose other end has been provided with

a catching hook comprising a lockable catching jaw which opens downwardly or upwardly, with the catching hooks, for coupling purposes, being suitable for engaging, or being released from, the corresponding coupling points of the implement to be coupled, wherein the upper hitch arm is resiliently held by tensioned springs to move upwards or downwards relative to the tractor with the lower hitch arms, with the



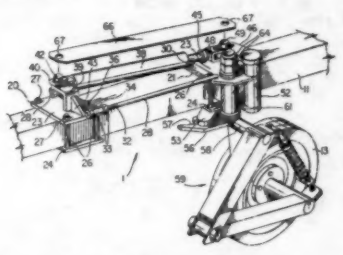
upper hitch arm moving in a direction opposite to the lower hitch arms, the upper hitch arm being held by providing two intermediate tension springs, one end of each of which is connected to the upper hitch arm and the other end of each of which is connected to a pulling means, which is first guided by guide means fixed to the rear of the tractor and then attached to lifting arms or lifting bars of the lower hitch arms or to the lower hitch arms themselves.

4,944,355

CASTER WHEEL CONTROL APPARATUS

John Karchewski, Regina, Canada, assignor to Brandt Industries, Ltd., Saskatchewan, Canada

Filed Jul. 3, 1989, Ser. No. 375,355
Claims priority, application Canada, Jul. 20, 1988, 572602
Int. Cl.[5] A01B *73/06*
U.S. Cl. 172—278 **6 Claims**



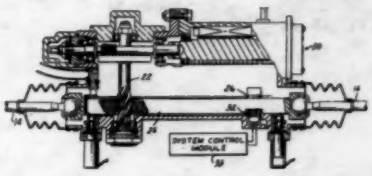
1. An apparatus for controlling a caster wheel assembly on a farm implement of the type including a boom for rotation between a transport position in which the boom is aligned with the direction of implement travel and a field position in which the boom is angled or perpendicular to the direction of implement travel, said apparatus comprising fluid actuated cylinder means for mounting on the boom; piston rod means extending out of said cylinder means; linkage means connected to said piston rod means for rotation thereby and releasably engageable with said wheel assembly, said linkage means including lever means connected to said piston rod means for rotation thereby; and arm means extending outwardly from said wheel assembly for releasable engagement by said lever means, wherein initial extension of said piston rod means rotates said lever means which engages and rotates said arm means and consequently said wheel assembly to a turning position, further extension of said piston rod means causes the release of said arm means and of said wheel assembly permitting free castering thereof in the field position, and retraction of said piston rod means causes re-engagement of said arm means by said lever means to lock the wheel assembly in the transport position.

4,944,356

STEERING SYSTEM POSITION DETECTOR

Algis Oslapas, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1988, Ser. No. 291,087
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 **9 Claims**



1. A system for continuously detecting the operational position of an automotive steering gear, comprising:

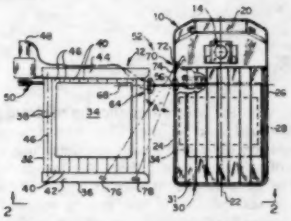
a magnet attached to a rack member which is reciprocably mounted within said steering gear, with said rack being linked with the output members of said steering gear; and means for continuously detecting the position of said magnet as said steering gear is moved reciprocably, with said means comprising an inductive pick up coil which is incorporated into a bearing for slidably supporting said steering rack.

4,944,357

POWER TRANSFERRING ARRANGEMENT

John E. Wible, Painesville, Ohio, and Paul D. Grohsmeyer, Dunlap, Ill., assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Apr. 27, 1989, Ser. No. 343,704
Int. Cl.[5] B60T *7/16*
U.S. Cl. 180—169 **25 Claims**



1. A power transferring arrangement for passing electrical energy from an electrical energy source between an automatic guided vehicle having a frame, and a longitudinal vehicle axis and a load transfer station; comprising:

a contactor assembly having a contacting head portion movably connected to the frame, said contacting head portion being movable between a first position closely adjacent the frame and a second position outwardly of the frame and spaced from the first position;

means for receiving said contacting head portion and passing electrical energy from said source and between the vehicle and load transfer station;

means for sensing the position of the vehicle relative to the load transfer station and delivering a position control signal in response to the automatic guided vehicle being at a predetermined location adjacent the load transfer station;

control means for receiving the position control signal and delivering an actuator control signal in response to receiving said position control signal; and

actuator means for moving said contacting head portion

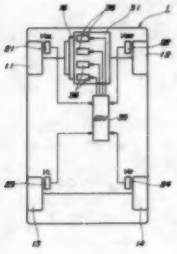
from said first position toward said second position and into engagement with said receiving means in response to receiving said actuator control signal.

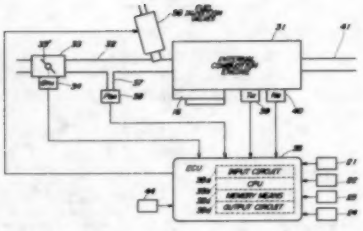
4,944,358

DRIVING WHEEL SLIP CONTROL SYSTEM FOR VEHICLES

Yoshio Wazaki, and Tetsuya Oono, both of Wako, Japan, assignors to Honda Gikeu Kogyo Kabushiki, Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,830
Claims priority, application Japan, Mar. 23, 1988, 63-68700
Int. Cl.[5] B60K 3/00
U.S. Cl. 180—197 **5 Claims**





1. In a system for controlling the slip of driving wheels of a vehicle equipped with an internal combustion engine, including deceleration detecting means for detecting a decelerating condition of said engine, slip detecting means for detecting a slip state of at least one of said driving wheels, and torque reducing means operable in response to output from said slip detecting means for reducing the torque of said driving wheels,

the improvement comprising inhibiting means for inhibiting operation of said torque reducing means irrespective of the output from said slip detecting means when said decelerating condition of said engine is detected by said deceleration detecting means.

4,944,359

VEHICLE AND METHOD OF RELEASABLY COUPLING PARTS OF THE VEHICLE TOGETHER

Trevor D. Doman, 44, Birmingham New Road, Wolverhampton, West Midlands; John R. Buttery, 20 Maisons Place, Newport, Shropshire, both of United Kingdom, and Royston M. Gould, 6 Muirfield Crescent, Oakham Green, Tividale, Warley, West Midlands, Great Britain

Filed Jul. 28, 1988, Ser. No. 225,238
Int. Cl.[5] B62D 27/06; B62K 5/06, 11/02
U.S. Cl. 180—208 **11 Claims**

1. A vehicle comprising front and rear members, front and rear ground-engaging wheels for supporting said members respectively, a two-part releasable coupling for coupling said members mechanically to each other, said coupling comprising two coupling parts, one of said parts being provided on the front member and the other of said parts being provided on the rear member, and stop means provided on said rear member for engaging the ground when the rear member is uncoupled from the front member and is rocked backwards, said stop means being disposed rearwards of the rear wheels, wherein said coupling part on the front member has a downwardly facing

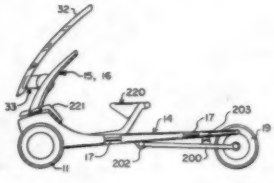
seat and said coupling part on the rear member has a load-receiving element on which the seat rests, wherein said coupling part on the rear member further includes a locking element which is spaced upwardly from the load-receiving element and is movable upwardly and downwardly to vary the vertical separation between the load-receiving element and the locking element and wherein said coupling part on the front member has an upwardly facing seat for receiving the locking element.

4,944,360

PLATFORM ORIENTED TRANSPORTATION VEHICLE

Daniel D. Sturges, 4346 Prado Dr., Boulder, Colo. 80303

Continuation-in-part of Ser. No. 175,815, Mar. 31, 1988. This application Mar. 15, 1989, Ser. No. 321,831
Int. Cl.[5] B62M 1/00
U.S. Cl. 180—210 **23 Claims**



1. A vehicle having front and rear ground engaging wheel means, comprising:

a unitary and generally horizontal load bearing platform having spaced front and rear platform portions,

means defining a first horizontal axis of rotation for supporting said front wheel means on the underside of said platform adjacent to said front platform portion, whereby said front wheel means operates to support said front platform portion above the ground,

an arm having a first end portion pivoted relative to the underside of said platform adjacent to said front platform portion, and having a second end portion spaced from said first end portion and defining a second horizontal axis of rotation for supporting said rear wheel means relative to the underside of said platform adjacent to said rear platform portion, said arm having a generally horizontal position wherein said arm extends in a direction generally away from said first horizontal axis of rotation,

releasable platform suspension means extending between the second end portion of said arm and said rear platform

portion without physically attaching the second end portion of said arm to said rear platform portion, whereby said rear wheel means operates to support said rear platform portion above the ground, and

means whereby said rear platform portion may be lifted vertically upward, whereupon the second end portion of said arm and said rear platform portion pivot away from each other, as said platform pivots about said first axis of rotation, as said arm pivots about the first end thereof, and as said rear wheel means remains in ground engagement, to thereby facilitate storage of said vehicle with said rear platform portion extending generally vertically upward, and with the second end portion of said arm extending generally vertically downward.

4,944,361

ACOUSTIC EAR MUFF

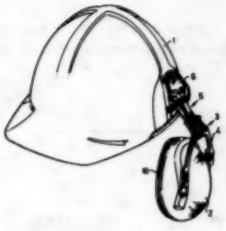
Mats E. G. Lindgren, Vikmanshyttan, and Ingvar S. Sjöovist, Sorunda, both of Sweden, assignors to AB Kompositprodukter S.K.-F.M., Vikmanshyttan, Sweden

Filed Aug. 29, 1988, Ser. No. 237,040

Claims priority, application Sweden, Sep. 2, 1987, 8703414

Int. Cl.[5] A42B *1/06*; G10K *11/00*

U.S. Cl. 181—129 **11 Claims**



1. An acoustic ear muff including a pad or cup (2) made of a rigid material and incorporating an opening for accommodating an ear of a wearer, and a resilient sealing annulus (10) which is located around a defining edge of said opening and which is intended to be brought into abutment with a head of the wearer, and further includes spring pressure exerting means (5) connected to a shell of a protective helmet (1) or to a head strap, characterized in that the spring pressure-exerting means is configured to produce a low pressing force which is substantially independent of head sizes which vary within given limits and in that the pressure exerting means includes a spring element (5), said spring element comprising a pair of elongate leaf spring having legs spaced apart from one another, one end of each of said leaf spring legs being secured to said shell while the other end of each of said spring legs are biased towards one another in a plane of said springs so as to impart a given twist thereto.

4,944,362

CLOSED CAVITY NOISE SUPPRESSOR

Russell E. Motsinger, Cincinnati, Ohio, and John W. Vdoviak, Marblehead, Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 25, 1988, Ser. No. 275,993

Int. Cl.[5] B64F *1/26*; F02K *1/82*

U.S. Cl. 181—213 **13 Claims**

1. An acoustic liner for a gas turbine engine duct comprising:

an inner annular facing;

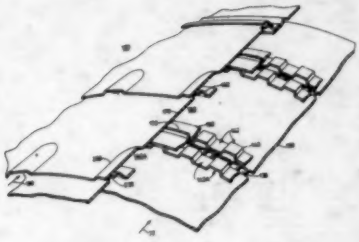
an outer annular wall spaced radially apart from said inner annular facing;

a plurality of annular Helmholtz resonator-type chambers having predetermined depths formed between said inner annular facing and said outer annular wall;

said chambers including necks having predetermined lengths wherein said neck lengths and said chamber depths run in a direction parallel to the gas flow;

an annular support member extending radially inward from said outer annular wall and forming at least a portion of axially spaced end walls of said chambers;

said annular support member including an annular flange at



a radially inner end of said support member and concentric with said annular wall having an axial length with respect to the engine that corresponds to said neck lengths of said chambers; and

at least one circumferentially disposed wiggle strip mounted between said concentric annular flange and said inner annular facing forming at least a portion of said necks.

4,944,363

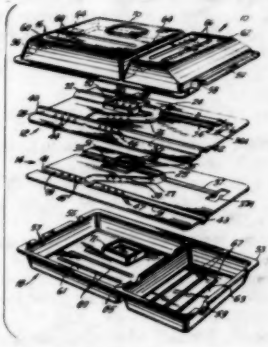
TOY BALL

John D. Osher, Shaker Heights, Ohio; Allison W. Katzman; Mark Luecke, both of Chicago, Ill., and John R. Wildman, North Riverside, Ill., assignors to Cap Toys, Inc., Bedford Heights, Ohio

Filed Feb. 6, 1990, Ser. No. 475,716

Int. Cl.[5] A63B *37/06*, *45/00*, *37/08*

U.S. Cl. 273—58 A **10 Claims**



9. A toy ball having a soft and supple feeling and a rebound percentage which is directly proportional to the height from which the ball is dropped, comprising:

a highly plasticized polyvinyl chloride core which is resiliently deformable due to its highly plasticized state and bleeds plasticizer;

a flexible polymer shell encasing said core for containing bleeding of the plasticizer from said core; and

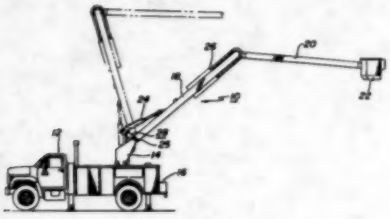
a stretchable fabric outer cover encasing said core and said flexible shell.

4,944,364

BOOM ELEVATING DEVICE FOR LINE LIFTS

Andrew G. Blasko, Riegelsville, Pa., assignor to Asplundh Tree Expert Co., Willow Grove, Pa.

Filed Apr. 24, 1989, Ser. No. 342,024
Int. Cl.[5] B66F *11/04*
U.S. Cl. 182—2 **16 Claims**



1. An improved boom elevating device for providing enhanced outward extension of a line lift, which comprises:

a mast assembly anchored to a vehicle bed;

a boom pivotally connected at one end to said mast assembly, said boom including a lower boom pivotally connected at a first end to said mast assembly and an upper boom connected to a second end of said lower boom;

at least one extension arm pivotally connected at one end at the point where said boom and mast assembly are pivotally connected;

a basket connected to the end of said upper boom;

a first expandable elevating means pivotally connected intermediate the ends of said boom at one end and the extension arm at its other end; and

a second expandable elevating means pivotally connected at one end to said mast assembly and at a second end to said extension arm, said second expandable elevating means rotating said extension arm relative to its pivotal connection to said mast assembly;

wherein when said first expandable elevating means and said second expandable elevating means are fully extended said lower boom achieves an angle of rotation greater than 90 degrees relative to said vehicle bed so as to maximize the outward extension of said upper boom and basket.

4,944,365

SAFETY NET SYSTEM

Alan J. Shalders, Purdys, N.Y., assignor to Universal Builders Supply, Inc., Mount Vernon, N.Y.

Filed Aug. 1, 1989, Ser. No. 388,580
Int. Cl.[5] E04G *21/32*
U.S. Cl. 182—138 **24 Claims**

1. A safety net system for capturing falling debris at a construction site, comprising:

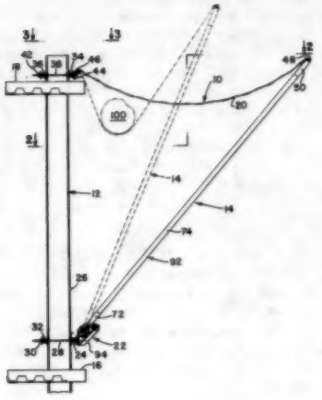
a plurality of mounting brackets attached to a lower level of a structure under construction at spaced locations around the perimeter thereof;

a corresponding plurality of elongate post assemblies, each having a horizontally extending shaft attached thereto adjacent a first, inner end thereof;

annular bearing means carried by the horizontal shaft of each post assembly;

adjustable clamping means carried by each mounting bracket for releasably clamping the annular bearing means carried by said corresponding post assembly to restrain said post assembly against vertical rotation, whereby said post assembly may be rotated between and clamped at an upright, stowed position and an inclined, deployed position;

each mounting bracket further including means defining a deployed-position stop for the corresponding post assembly; and



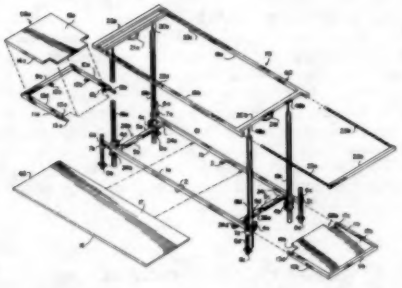
a safety net suspended between the second, outer ends of said plurality of post assemblies and an upper level of the structure.

4,944,366

PNEUMATICALLY OPERATED SCAFFOLDING

Dewey L. Pryor, and Charles L. Pryor, both of Reidsville, N.C., assignors to D. L. Pryor & Sons, Inc., Reidsville, N.C.

Filed Feb. 6, 1989, Ser. No. 306,758
Int. Cl.[5] E04G *1/22*
U.S. Cl. 182—141 **18 Claims**



18. Scaffolding comprising: a work support frame, a cylinder member, said cylinder member releasably attached to said support frame, a scaffold frame, means to pivotally attach said cylinder member to said scaffold frame, means to stop rotation of said cylinder, said stop means joined to said attaching means whereby said cylinder member can be rotated into a storage configuration when not in use wherein said attaching means comprises a c-clamp, a threaded member, said stop means consisting of a stop bar, said threaded member and said stop bar attached to said c-clamp, said c-clamp for engaging said cylinder and said threaded member for attachment to said scaffold frame.

4,944,367

INJECTION LUBRICATOR WITH PLURAL OUTLETS

John Nelson, Durham, N.H., and Robert B. Tosi, Littleton, Colo., assignors to Watts FluidAir Div. of Robertshaw Controls Company, Kittery, Me.

Filed Dec. 13, 1988, Ser. No. 283,617
Int. Cl.[5] F16N *11/10*
U.S. Cl. 184—29 **10 Claims**

1. An injection lubricator comprising

a lubricant pump having a pumping piston actuated by a pneumatic pulse to deliver a pulse of lubricant from a lubricant source to a lubricant pump outlet, said pump also having a pneumatic pulse outlet,

a lubricant distributor having a lubricant distribution inlet in communication with said lubricant pump outlet, a plurality of lubricant distribution outlets, and switchable flow paths within the distributor to cause one said lubricant distribution outlet to be connected to said lubricant distribution inlet at one time, and

a pneumatically-actuated piston that receives pneumatic pulses from said pneumatic pulse outlet and advances said lubricant distributor to switch to a different lubrication outlet with the application of each pneumatic pulse,

wherein said lubricant distributor includes a distribution member having a plurality of openings connected via said flow paths to said distribution outlets, and wherein said lubricant distributor includes a movable member that has a single movable outlet that is moved to different positions at which the single movable outlet sequentially mates with a plurality of openings in said distribution member,

further comprising means defining a lubricant chamber in communication with said lubricant distribution inlet, and further comprising a check valve providing discharge of a lubricant from said chamber to said lubricant source when pressure in said chamber exceeds a predetermined value.

4,944,368

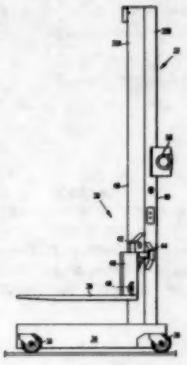
LIFT TRUCK HAVING IMPROVED SINGLE MAST AND BEARING WHEEL ASSEMBLY

J. Christopher Duderstadt, 1327 Tenth Ave., San Francisco, Calif. 94122

Filed May 25, 1989, Ser. No. 357,496
Int. Cl.[5] B66B *9/20*
U.S. Cl. 187—9 R **10 Claims**

1. An improved mast structure and lifting carriage bearing wheel assembly for a lifting apparatus comprising:

a rectangular mast, said rectangular mast having four edges, a front edge of said mast being formed by an intersection of first and second sides of said mast, said front edge being positioned so as to be pointed generally in a direction of a load supporting assembly connected to a lifting carriage, a first side edge of said mast being formed by an intersection of said first side of said mast with a third side of said mast, a second side edge of said mast being formed by an intersection of said second side of said mast with a fourth side of said mast, said first and second side edges of said mast being pointed in opposite directions approximately perpendicular to said direction of said front edge of said mast, and a rear edge of said mast being formed by an intersection of said third and fourth sides of said mast, said rear edge being pointed in a direction opposite to said front edge of said mast; and



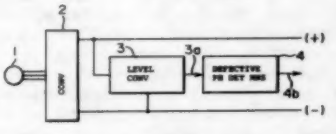
a set of bearing wheel assemblies connected to said lifting carriage, said set of bearing wheel assemblies comprising a first bearing wheel assembly secured to a bottom portion of said lifting carriage and contacting said first side of said mast, a second bearing wheel assembly secured to said bottom portion of said lifting carriage and contacting said second side of said mast, a third bearing wheel assembly secured to a top portion of said lifting carriage and contacting said third side of said mast, and a fourth bearing wheel assembly secured to a top portion of said lifting carriage and contacting said fourth side of said mast.

4,944,369

SAFETY DEVICE FOR ELEVATOR

Shigemi Iwata, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 14, 1988, Ser. No. 218,884
Claims priority, application Japan, Jul. 17, 1987, 62-178292
Int. Cl.[5] B66B *5/02*
U.S. Cl. 187—105 **9 Claims**



1. A safety device for an elevator comprising:

a converter which converts a 3-phase A.C. power supply into a D.C. power supply having a voltage waveform which remains substantially at peak value and above a reference value for all single phase periods of the power supply voltage and, when one or more phases of the power supply voltage are defective, drops to a low voltage below the reference value during any defective single phase periods,

a control circuit for the elevator employing as a power

supply the D.C. power supply outputted from said converter,

a level converter which converts the voltage waveform of said D.C. power supply outputted from said converter into a logic level signal with a different logic level for, respectively, peak value periods representing an uninterrupted power supply and low voltage periods representing one or more defective phases, and

defective phase detecting means for detecting a defective phase of the 3-phase A.C. power supply by sampling the logic level signal of said level converter in a time division manner and determining a defective phase in response to the level of the logic level signal.

4,944,370

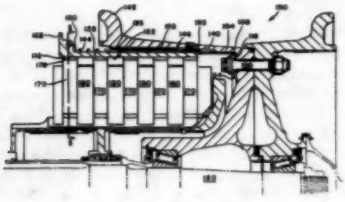
DRUM DRIVE FOR USE WITH MULTIPLE DISC BRAKES

Warren D. Chambers, and Jeffrey T. Jurczak, both of South Bend, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 27, 1989, Ser. No. 329,211

Int. Cl.[5] F16D *55/36*

U.S. Cl. 188—71.5 **9 Claims**



1. A drum drive of a disc brake for a single wheel and having a plurality of interleaved nonrotatable stator discs and rotatable rotor discs wherein the rotor discs are connected with the single wheel, the drum drive comprising an annular drum having an axial length which extends axially from an inboard end to an outboard end, the inboard end having an end opening and the outboard end having an end opening, an interior axially extending opening between the end openings, the drum including at spaced positions thereabout a plurality of axially extended splines which extend radially inwardly into the interior axially extending opening, the outboard end of the drum including a radially inwardly extending flange with an interior edge defining the end opening at the outboard end, the flange having a plurality of opening means receiving wheel fastening means thereat, the axially extending splines engaging complementary-shaped openings in said rotor discs in order to connect said rotor discs with said wheel, the inboard end of the drum having a radially outwardly extending opposite flange, and the axial length of the drum disposed substantially within the wheel such that a substantial portion of an exterior surface of the drum is spaced substantially radially apart from an interior surface of the wheel, so that radial spacing between the surfaces minimizes radial loading upon said discs caused by wheel deflection, the single wheel comprising two wheel parts held together by the wheel fastening means, and continuous annular heat shield means disposed exteriorly of the drum and extending axially within said wheel, the shield means extending axially at one end to abut the opposite flange and at the other end supported by the drum.

4,944,371

DISC BRAKE WITH A CALIPER BODY AND PADS RETAINED IN THE CALIPER BODY BY HOOKS

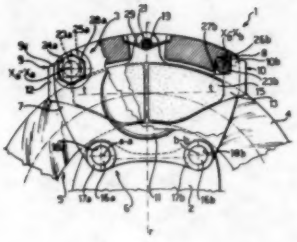
Alberto Giorgetti, Brembate Sopra, Italy, assignor to Via Provinciale, Paladina, Italy

Continuation of Ser. No. 752,940, Jul. 8, 1985, abandoned. This application Jun. 22, 1989, Ser. No. 370,146

Claims priority, application Italy, Jul. 9, 1984, 22508/84[U]

Int. Cl.[5] F16D *65/06*

U.S. Cl. 188—73.39 **1 Claim**



1. A disc brake mountable on a stationary support integral with a part of a vehicle and about a rotatable disc, said disc brake being used for braking the rotation of said rotatable disc, comprising:

a caliper having a first and second jaw adapted to be slidably mounted on opposite sides of said rotatable disc;

a pair of brake pads having hook shaped ends, said hook shaped ends opening away from the rotational axis of the rotatable disc, and positioned on opposite sides of said rotatable disc in a direction tangential to said rotatable disc;

a hydraulic cylinder for urging at least one of said pair of brake pads against said rotatable disc; and

a pair of axially extending pins positioned at either end of said caliper and engaging said hook shaped ends of said brake pads, each of said pins connecting the first jaw to the second jaw and tightened to a predetermined force so as to provide a preloaded action against the braking force of said cylinder.

4,944,372

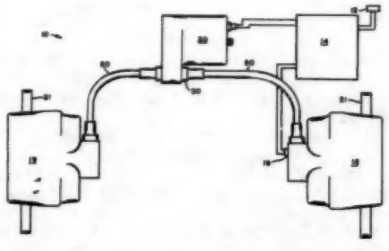
ELECTRICALLY ACTUATED BRAKING SYSTEM

Alistair G. Taig, Edwardsburg, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 15, 1988, Ser. No. 284,517

Int. Cl.[5] B60T *13/74*

U.S. Cl. 188—156 **21 Claims**



1. An electrically actuated braking system, comprising controller means connected with drive motor means, the controller means for sending signals to control operation of the drive

motor means, the drive motor means operating a load-equalizing differential which is connected with flexible drive connection means, the flexible drive connection means connected with brake members, the load-equalizing differential comprising a drive member disposed between two opposed plates and having a plurality of openings receiving therein ball means, each opposed plate having ramps connected with cam tracks, the ramps and cam tracks of one plate shaped complementary with the ramps and cam tracks of the opposed plate, the controller means effecting operation of the drive motor means which rotates the drive member, rotation of the drive member effecting via the ball means rotation of the opposed plates which move relative to one another so that equal torque is transmitted to the brake members.

4,944,373

DISC BRAKE PAD

Kazuyuki Ohya, and Hidenori Kimbara, both of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 1, 1989, Ser. No. 359,554
Claims priority, application Japan, Jun. 3, 1988, 63-135436
Int. Cl.[5] F16F *69/02*
U.S. Cl. 188—251 A **6 Claims**

1. A disc brake pad which comprises an integral mass produced by molding a friction material-forming thermosetting resin composition together with a substrate under heated and pressurized conditions, said thermosetting resin composition comprising:

(A) about 7–40 parts by weight of a cyanate ester-based curable resin composition selected from the group consisting of (a) polyfunctional cyanate esters, prepolymers of said cyanate ester, and prepolymers of said cyanate ester with an amine; and (a) in combination with at least one of (b) a polyfunctional maleimide, a prepolymer of said maleimide or a prepolymer of said maleimide with an amine, and (c) an epoxy resin;

(B) about 25–70 parts by weight of at least one fibrous reinforcement material having a fiber diameter of not less than 0.1 μm, and

(C) about 15–60 parts by weight of at least one friction abrasion moderator agent.

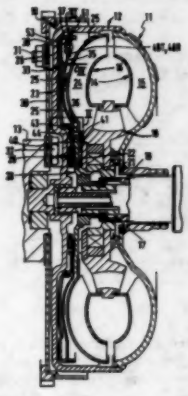
4,944,374

LOCK UP CLUTCH FOR A HYDRO-KINETIC COUPLING APPARATUS, ESPECIALLY FOR AN AUTOMOTIVE VEHICLE

Pierre Casse, Ermont, and Jean Bionaz, Fontenay-Sous-Bois, both of France, assignors to Valeo, Paris, France

Filed Jan. 18, 1989, Ser. No. 298,172
Claims priority, application France, Jan. 18, 1988, 88.00488
Int. Cl.[5] F16H *45/02;* F16D *3/06*
U.S. Cl. 192—3.29 **7 Claims**

1. A lock up clutch for a hydro-kinetic coupling device, particularly for an automotive vehicle, said clutch being of the kind comprising a coupling element adapted to act as a piston, and a clutch or hub plate coupled with said coupling element for rotation therewith so as to permit the clutch plate and coupling element to be driven together in rotation, said clutch plate having strip portions integral therewith and axially deformable for rigid engagement of the clutch plate with said coupling element, the clutch plate being itself adapted to be coupled to a drive member for rotation therewith, the clutch being characterized in that the clutch plate has, in combination, two groups of said strip portions, namely a first group in which the strip portions extend circumferentially in one direction and a second group in which the strip portions extend circumferentially in the opposite direction, whereby the coupling element can be driven positively in rotation, tenons being provided on the clutch plate for coupling pairs of said strip portions with the coupling element, there being only one said tenon for the two strip portions of any one pair thereof, the coupling element having an axial edge portion at its outer periphery, said axial edge portion being provided with slots, and each said tenon extending substantially radially from the



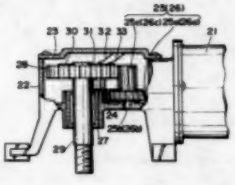
clutch plate and being engaged in a corresponding said slot with the slot constituting a mortice.

4,944,375

REDUCTION GEARING DEVICE FOR A WINDSHIELD WIPER MOTOR INCLUDING A UNIDIRECTIONAL BRAKE

Kenji Ohta, and Yasuo Ohashi, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 20, 1985, Ser. No. 746,692
Claims priority, application Japan, Jun. 22, 1984, 59-93942[U]
Int. Cl.[5] F16D *67/02;* B60T *7/12*
U.S. Cl. 192—8 R **4 Claims**



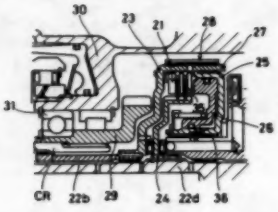
1. A reduction gearing device for a windshield wiper motor adapted to drive a wiper blade comprising a housing, a reduction gearing mechanism disposed in said housing having a plurality of gear members, bearing means rotatably supporting said gear members in said housing, electrical contact means for a stop position controlling system for the wiper motor operatively associated with one of said gear members for rotation therewith for stopping the wiper motor at a predetermined position, unidirectional brake means interposed between one of said gear members and said housing to prevent reverse of said gear members and said electrical contact means due to attempted reverse rotation of the wiper motor as a reaction when shut off due to forced stoppage of the wiper blade.

4,944,376

BRAKE BAND DRUM FOR PLANETARY GEAR-TYPE TRANSMISSIONS

Kazuhisa Ozaki, and Masakatsu Miura, both of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Mar. 11, 1988, Ser. No. 167,279
Claims priority, application Japan, May 2, 1987, 62-109181
Int. Cl.[5] F16D *67/04, 25/063*
U.S. Cl. 192—17 A 3 Claims



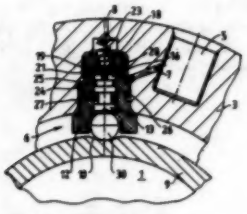
1. A brake drum for a planetary gear type automatic transmission comprising a clutch formed inside a press manufactured planetary gear input member coupled to a press-manufactured clutch cylinder and to one member of a planetary gear mechanism, said planetary gear input member having an outer peripheral surface formed to include an engaging surface of a band brake and an inner peripheral surface finished by machining for centering said clutch cylinder, said engaging surface having one of fitting holes or slots, and said clutch cylinder having projections fitted within said one of said fitting holes or slots for providing uniform movement between said clutch cylinder and said planetary gear input member.

4,944,377

SAFETY COUPLING

Ernst Elsner, Herbrechtingen, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 8, 1988, Ser. No. 281,517
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742658
Int. Cl.[5] F16D *7/06*
U.S. Cl. 192—56 F 7 Claims



1. A safety coupling, comprising:

a shaft;

a hub disposed coaxially about said shaft, said hub including an annular chamber in fluid communication with an externally communicating fluid connection, the annular chamber being pressurizable by a fluid introducible therein via the fluid connection;

a release valve fastened to the hub and connected in fluid communication with the annular chamber, said release valve having a valve body and seat and a substantially radially oriented movable actuating member which is movable radially outwardly from an operationally ready position in which the actuating member is at rest and the valve is closed by fluid pressure prevailing in the annular chamber acting on the valve body, to a release position in which the actuating member displaces the valve body and the valve is opened thereby; and

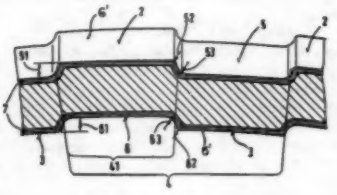
release member means fastened to the shaft coaxially thereto for moving the movable actuating member of the release valve from the operationally ready position to the release position when, as a result of a torque overload, the release member is displaced with respect to the hub.

4,944,378

SYNCHRONIZING RING

Klaus Christian, Immenstaad, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP87/00200, § 371 Date Sep. 29, 1988, § 102(e) Date Sep. 29, 1988, PCT Pub. No. WO87/06314, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 11, 1987, Ser. No. 274,056
Claims priority, application Luxembourg, Apr. 16, 1986, PCT/EP86/00222
Int. Cl.[5] F16D *23/04*
U.S. Cl. 192—107 M 3 Claims



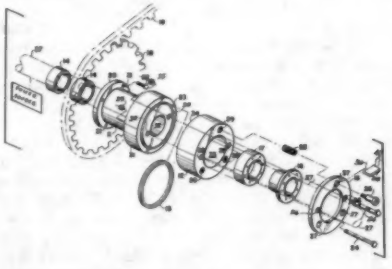
1. A synchronizing ring for a synchronizing assembly in a transmission of a motor vehicle which comprises a synchronizing ring body having parallel conical inner and outer surfaces and formed along each of said surfaces with uniformly spaced apart lands separated by grooves so that the lands and the grooves along each of said surfaces are respectively of equal circumferential width, each of said surfaces having a friction coating and each groove in said outer surface being disposed in a region corresponding to a land of said inner surface and each land of said outer surface being disposed in a region of said body corresponding to a location of a respective groove of the inner surface.

4,944,379

TORQUE LIMITER

James D. Haaser, Toledo, Ohio, assignor to Dynamic Research and Development Corp., Toledo, Ohio

Filed Nov. 5, 1987, Ser. No. 116,976
Int. Cl.[5] F16D *9/00*
U.S. Cl. 192—150 11 Claims



1. A torque limiting device for use on a shaft delivering torque to a power transmission element being rotated by said shaft; the device comprising:

(a) an adapter which rotates freely around said shaft and is attached at one end thereof to a power transmission element and having a planar face at the other end thereof;

(b) a sleeve firmly affixed to said shaft adjacent to said face;

(c) a clutch element having opposing surfaces with a high coefficient of friction and adapted to be compressed between said adapter and said sleeve; and

(d) shear pin means connecting said adapter to said sleeve with said clutch element therebetween being compressed with force applied by said shear pin means.

4,944,380

DIAPHRAGM SPRING DEVICE IN A CLUTCH

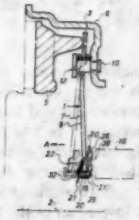
Seiichi Kitano; Masaaki Asada, and Michitomo Masaki, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 13, 1988, Ser. No. 283,715

Claims priority, application Japan, Dec. 18, 1987, 62-193276[U]

Int. Cl.[5] F16D *13/44, 13/70*

U.S. Cl. 192—89 B **3 Claims**



1. A diaphragm spring device comprising:

a diaphragm spring including a radially outer portion seated on a rear surface of a pressure plate located in front of said diaphragm spring, a portion to be supported through fulcrum means by a clutch cover located at the rear of said diaphragm spring, a plurality of slits extending from an inner periphery of said diaphragm spring to a radially middle portion thereof, a plurality of tongues divided by said slits and having radially inner ends adapted to be pushed in an axially forward direction by a release bearing;

an annular lever plate seated on rear surfaces of said ends of said tongues and having a radially extending portion through which said radially inner ends of the tongues are pushed by said release bearing and a portion extending axially forward from said radially extending portion against which said radially inner ends of said tongues project;

an annular fixing bushing fixed to the inner periphery of said lever plate, and having a spring seat flange at a forward end which is located in front of said tongues and is pressed against and projects radially outwardly beyond an adjacent end of said axially extending portion of said lever plate and having a rear end radial flange which is pressed against a rear end of said axially extending portion of said lever plate; and

a conical spring interposed between said spring seat flange and said tongues precisely axially registering said plurality of tongues with each other in a circumferential direction of said diaphragm spring device.

4,944,381

MULTI-DIRECTIONAL VIBRATORY CONVEYOR

Terry M. Riley, Santa Cruz, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 5, 1989, Ser. No. 402,939

Int. Cl.[5] B65G *47/46*

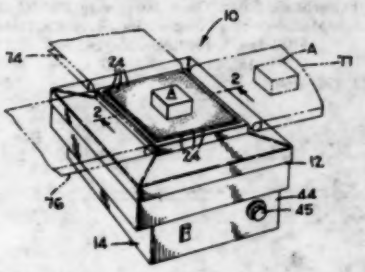
U.S. Cl. 198—370 **22 Claims**

1. A method of conveying and controlling the direction of movement of an article, comprising the steps of;

supporting the article on the top of a plurality of fingers in a bed of fingers;

maintaining the fingers parallel to each other with each finger having an upper and a lower end;

supporting the lower end of the fingers on a plate;



supporting an article to be conveyed on the upper ends of portions of several of the fingers;

vibrating the plate and fingers; and

pivoting the fingers in a plurality of different directions for conveying and controlling the direction of movement of the article in a plurality of selected directions.

4,944,382

APPARATUS FOR ORIENTING PARTS IN FEEDING DEVICES OF VARIOUS UNITS

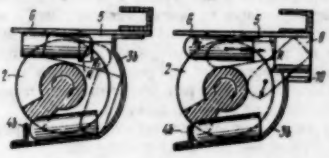
Vladimir T. Gradoboev, ulitsa Kropotkina, 120/1. kv. 86; Leonid I. Melnikov, ulitsa Dm.Donskogo, 19, kv. 19; Alexandr M. Klimenov, Nevelskogo, 5, kv. 45, and Alexandr E. Sitnikov, ulitsa Leskova, 250, kv. 39, all of Novosibirsk, U.S.S.R.

Filed Apr. 29, 1987, Ser. No. 43,847

Claims priority, application U.S.S.R., Oct. 18, 1983, 3667922

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—399 **3 Claims**



1. An apparatus for orienting parts in feeding devices of various units, comprising:

a feeding hopper for the parts to be oriented;

a working member in the form of a screw conveyor extending vertically and withdrawing parts from said feeding hopper;

a guide member and a confining member for maintaining the parts in a pre-set position during feeding, which are provided on said workilng member;

members for picking-up improperly oriented parts and means for reorienting parts located in a gap between said guide and confining members said guide and confining members being offset downstream from said gap in the direction of movement of said screw conveyor, said picking-up members comprising an identifying cam and a control cam which are mounted as an extension of the guide and confining members in such a manner that the parts being oriented which have an asymmetrical surface configuration with respect to a plane drawn through the middle thereof, at right angles to their axes and which are fed with an improper orientation are engaged by said members and caused to turn into a proper orietation in

said reorienting means, and the parts which are properly oriented are caused to pass by said reorienting means.

4,944,383

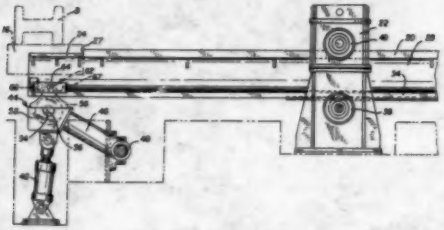
FURNACE CHARGER APPARATUS

Peter Petrachkoff, Salem Ohio, assignor to PRMG, d./b./a. Fordees Manufacturing Company Inc., Leetonia, Ohio

Filed Jan. 3, 1989, Ser. No. 292,946

Int. Cl.[5] B65G *25/00*

U.S. Cl. 198—468.6 **6 Claims**



1. In combination with a workpiece handling apparatus having a horizontal extending arm and a workpiece carrying means at its one end for effecting vertical and horizontal manipulations of the workpiece,

said arm having opposed horizontal relatively friction free contacting surfaces comprising a lower contacting support surface for said arm and two upper surfaces serving as restraining surfaces for said arm,

a support and lifting means for said arm, including:

first roller means for engaging said lower arm contacting surface in a manner to support said arm while permitting relative movement therebetween,

second roller means comprising two cooperative pairs of spaced anti-friction rollers, including means for mounting each cooperative pair of rollers on an opposite side of said arm with respect to said two upper contacting surfaces, in a manner that said two upper contacting surfaces move beneath the cooperative pairs of rollers and contact their adjacent surfaces to restrict vertical relative movement between said arm and said second roller means,

means for pivotally mounting said cooperative pairs of rollers in a manner that said pairs move as a unit whereby both rollers of each pair are positionable to accomplish said restricting effect on said arm,

power means connected to said arm and said support means for moving said arm and support means for effecting said horizontal and vertical manipulations, respectively.

4,944,384

TRASH DISCHARGE APPARATUS FOR CROP TRANSFERRING CONVEYOR MECHANISM

Maynard M. Herron, Hesston, Kans., assignor to Hay & Forage Industries, Hesston, Kans.

Filed Jan. 30, 1989, Ser. No. 303,632

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—494 **14 Claims**

1. A material-conveying apparatus comprising:

a frame;

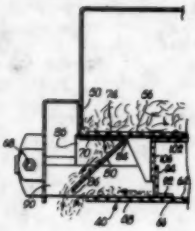
a first guide roller mounted on the frame for rotation about a first axis;

a second guide roller mounted on the frame for rotation about a second axis spaced from and parallel with the first axis;

an endless belt including lateral edges and being supported on the first and second guide rollers for travel in a path extending around the first roller, along an upper run, around the second roller and along a lower run, the belt being adapted to convey material along the upper run during travel of the belt;

a pair of support plates each extending beneath one of the lateral edges of the belt along the upper run, each of the support plates including an opening extending therethrough which permits material passing incidentally between the belt and the support plate to pass through the opening to an area beneath the support plate; and

a pair of deflection plates each disposed in the area beneath the belt and directly beneath the opening of one of the belt support plates, the deflection plates each including an



upper edge which is disposed laterally inward of the opening beneath which the deflection plate is disposed and extending downward and laterally outward relative to the upper run of the belt to a lower edge which is disposed laterally outward of one of the edges of the belt, whereby the material passing through the openings is directed by the deflection plates to an area laterally displaced from the lower run of the belt.

4,944,385

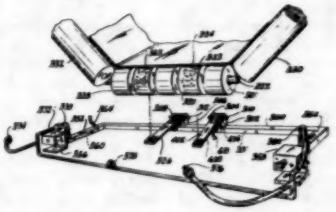
ENDLESS BELT MOISTURE CONTROL APPARATUS

Barry G. Shelby, 410 N. College St., Greenville, Ky. 42345

Continuation of Ser. No. 244,156, Sep. 14, 1988, abandoned. This application May 25, 1989, Ser. No. 357,692

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—495 **19 Claims**



1. An apparatus for controlling the moisture content of an endless moving belt comprising:

means for electrically conducting a signal;

means having a surface for providing electrical contact between the means for conducting and the belt, the means for providing being rotatable relative to the means for conducting;

means connected to the conducting means for detecting the belt resistance and providing a resistance signal having a magnitude representative of the belt resistance;

means for comparing a magnitude of the resistance signal to a magnitude of a preset reference signal and providing an activating signal when the resistance signal is greater than the reference signal; and

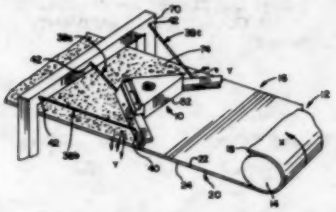
means responsive to the indicating means for increasing the moisture level of the belt when the moisture level falls below the predetermined minimum.

4,944,386

SCRAPER FOR CONVEYOR BELTS

Robert T. Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponset, Ill.

Filed Jan. 8, 1990, Ser. No. 461,668
Int. Cl.[5] B65G 45/00
U.S. Cl. 198—499 14 Claims



1. A mechanism for removing material from the surface of a conveyor belt said mechanism including:

a blade adapted to be positioned adjacent said conveyor belt surface;

means for securing said blade in position relative to said conveyor belt, said securing means allowing said blade to move in a vertical direction in response to vertical deflections of said belt; and

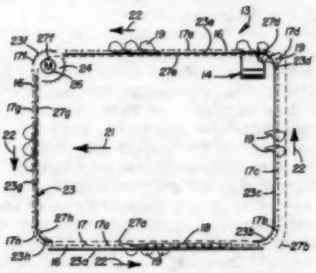
ballast container means associated with said blade for receiving varying amounts of a ballast material, whereby the force exerted by said container means and said ballast material urges said blade into engagement with said belt with a force dependent upon the mass of the ballast in said container.

4,944,387

BUCKET CONVEYOR SYSTEM

Desmond C. Burke, Mildura, 3500 Victoria, Australia

Filed Dec. 30, 1988, Ser. No. 292,528
Claims priority, application Australia, Jan. 5, 1988, 0017/88
Int. Cl.[5] B65G 47/40
U.S. Cl. 198—706 8 Claims



1. A bucket conveyor system for a harvesting machine which can move along a row of plants, said bucket conveyor system comprising:

a pair of parallel endless chains each having spaced apart roller bearings,

means forming generally rectangular chain guides for said endless chains to confine and guide said chains for movement rearwardly along a lower horizontal path, upwardly along an upward vertical path, forwardly along an upper horizontal path, downwardly along a downward vertical path, and along four curved paths at the four corners between the horizontal and vertical paths,

a plurality of open-topped buckets connected to said endless chains at equally spaced intervals therealong, said buckets each having two side walls, a front wall, a rear wall, a rear lip extending between said side walls and rearwardly of said rear wall, and an upper edge around side walls, front wall and rear lip, the rear lip of each bucket extending over and beyond the front wall of the next bucket rearward thereof during movement of said chains along said lower path, said buckets each having a single pivot shaft extending outwardly from the upper end of each of said side walls, said shafts extending into roller bearings of said endless chains and being the sole connection of said buckets to said endless chains,

a first fixed bucket guide member engageable with the upper edge of said buckets for maintaining said buckets erect during movement of said buckets along said lower horizontal path,

a second fixed bucket guide member engageable with said buckets for maintaining said bucket substantially erect during movement of said bucket along said upward path,

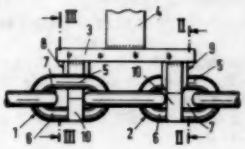
a third fixed bucket guide member engageable with said buckets for inverting said buckets over a discharge conveyor having a generally vertical wall spaced forwardly of said second fixed bucket guide member during movement of said buckets along said curved path between said upward path and said upper horizontal path and along said upper horizontal path, said third fixed guide member being positioned to first engage said buckets after their lips have moved forwardly of said discharge conveyor wall.

4,944,388

CHAIN CONVEYOR

Hans Dalferth, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to RUD-Kettenfabrik Rieger and Dietz GmbH u. Co., both of Aalen, Fed. Rep. of Germany

Filed Mar. 10, 1989, Ser. No. 321,913
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808827
Int. Cl.[5] B65G 19/24
U.S. Cl. 198—731 11 Claims



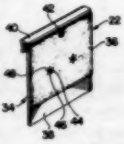
1. Chain conveyor comprising at least one drive chain strand, passng over chain wheels (14) and having oval round-steel links for conveying elements (4), which are connected to the drive chain strand via coupling elements (8,9) which are fixed to retaining plates (3) of the conveying elements (4) and pairs of which engage from a same side into the clear inner spaces (7) of a pair of connecting chain links (1,2) which directly follow one another and have the same orientation, each of said connecting chain links having two longitudinal legs (5,6), the coupling elements of each pair of coupling elements (8,9) being arranged in opposite directions into the clear inner spaces (7) of the connecting chain links (1,2) of each pair of connecting chain links in planes oriented at right angles to the longitudinal legs (5,6) of said connecting chain links (1,2), characterized in that one longitudinal leg (6) of each connecting chain link (1,2) is guided in a guide hollow (11) of each coupling element (8,9) and the other longitudinal leg (5) bears against a stop which is likewise formed by each coupling element (8,9) and limits movement of each coupling element (8,9) into said connecting chain link engaged by said coupling element.

4,944,389

METHOD OF ASSEMBLING EARRING AND DISPLAY CARD ASSEMBLY AND ASSEMBLY THEREBY FORMED

Edward I. Robertson, North Providence, R.I., assignor to E. D. R. Industries, Inc., Providence, R.I.

Filed Dec. 20, 1989, Ser. No. 453,770
Int. Cl.[5] B65D *73/00*
U.S. Cl. 206—6.1 **16 Claims**



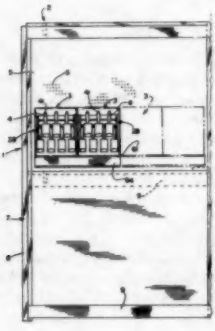
1. An earring and display card assembly comprising a card portion including a substantially flat card member having front and rear sides, said card member having a reduced aperture therethrough and a plurality of slits which radiate outwardly from said aperture to define a plurality of resilient fingers therearound, and an earring portion including an ornament member having front and rear sides, a post extending rearwardly from said ornament member and clutch means received and releasably frictionally retained on said post, said aperture being normally dimensioned to receive said post therethrough but not said clutch means, said fingers being rearwardly deflectable for receiving said post with said clutch means thereon through said aperture, said earring portion being assembled with said card member so that said post extends through said aperture with said ornament member disposed on the front side of said card member and at least a portion of said clutch means disposed on the rear side of said card member.

4,944,390

MERCHANDISING SYSTEM FOR PAINT BRUSHES AND THE LIKE

William E. Baucom, and Jeff Augustine, both of Canton, Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Jan. 2, 1990, Ser. No. 459,543
Int. Cl.[5] A47B *81/02*; B65D *5/50, 5/52*; A47F *5/00*
U.S. Cl. 206—44 R **25 Claims**



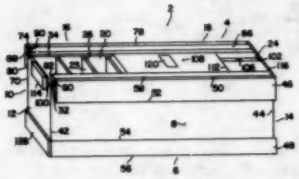
1. A carton for use in shipping and displaying paint brushes and the like, said carton having a bottom wall and upstanding side and end walls and an open top, and a wire frame within said carton, said wire frame comprising a base member, means for retaining said base member against said bottom wall, and a plurality of pegs extending generally perpendicular from said base member in spaced apart relation for supporting a plurality of brushes from said pegs.

4,944,391

CONTAINER AND DISPENSER OF COINS

Richard H. Johnson, 409 S. Orchard, Park Forest, Ill. 60466

Filed Aug. 21, 1989, Ser. No. 396,202
Int. Cl.[5] A45C *11/28*; B65D *43/20*
U.S. Cl. 206—0.83 **6 Claims**



1. A coin dispenser comprising an elongated container having a peripheral side wall surrounding an elongated cavity, said peripheral side wall extending from a first end to a second end, said peripheral side wall extending between an upper peripheral edge and a lower peripheral edge, said elongated container having an upper wall adjacent said upper peripheral edge, a spaced apart lower wall adjacent said lower edge, spaced apart partition means in said elongated cavity spaced apart in the direction from said first end of said elongated container to said second end thereof to provide a plurality of coin receiving and dispensing pockets in said elongated cavity, first cover means to selectively open and close respective ones of said coin receiving and dispensing pockets, and indicator stop means to indicate when each of said coin receiving and dispensing pockets has been opened, wherein said first cover means is positioned to selectively open and close said upper wall of said container to receive coins in said pockets through said upper wall when said first cover means is opened, to hold coins in said pockets when said first cover means is closed, and to dispense coins from respective ones of said pockets through said upper wall when said first cover means is selectively opened to open said respective ones of said pockets, said upper wall includes an elongated openable section extending from said first end of said peripheral wall toward said second end thereof and terminating at an intermediate point therebetween, an elongated closed upper wall section extending from said second end of said peripheral wall toward said first end thereof and terminating at said intermediate point therebetween, said first cover means being positioned to selectively open and close said elongated openable section of said upper wall of said container to receive coins in respective ones of said pockets through said elongated openable section of said upper wall when said first cover means is opened, to hold coins in said pockets when said first cover means is closed, and to dispense coins from respective ones of said pockets through said elongated openable section of said upper wall when said first cover means is selectively opened to open said respective ones of said pockets, said first cover means includes a first slidable cover member slidable on said elongated container between a fully closed position wherein it fully closes said elongated openable section of said upper wall and a fully open position wherein it fully opens said elongated openable section of said upper wall, said first slidable cover member being slidable over said elongated closed upper wall section as it is slidably moved from its fully closed position toward its fully open position, said first slidable cover member having an inwardly facing surface, said elongated closed upper wall section having an outwardly facing surface in facing relationship with said inwardly facing surface of said first slidable cover member as it is slidably moved toward its fully open position, said indicator stop means including a plurality of spaced apart first detent members of a first two part detent assembly positioned between said in-

wardly facing surface of said first slidable/cover member and said outwardly facing surface of said elongated closed upper wall section and spaced apart in the direction from said first end of said elongated container toward said second end thereof as well as spaced apart a distance corresponding to the spaced apart distance of said partition means, and a second detent member of said first two part detent assembly positioned to cooperatively couple with respective ones of said spaced apart first detent members thereof as said first slidable cover member is slidably moved from said fully closed toward said fully open position, one of said first and second detent members of said first detent assembly being affixed to said inwardly facing surface of said first slidable cover member and the other to said outwardly facing surface of said elongated closed upper wall section whereby said first slidable cover member selectively opens a respective one of said pockets to said openable section of said upper wall when slidably moved in the opening direction a distance sufficient to move said detent members of said first detent assembly from one cooperatively coupled position to the next adjacent cooperative coupling position.

4,944,392

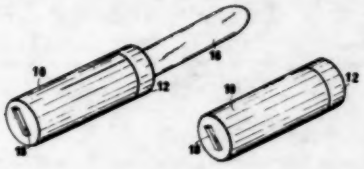
COMBINATION MATCH SAFE, KNIFE AND STRIKER

Harold L. Hull, 401 Canyon Way, Sp. 43, Sparks, Nev. 89434, and Thomas D. Newton, 136½ W. 2nd St., Reno, Nev. 89501

Filed Nov. 24, 1989, Ser. No. 440,720

Int. Cl.[5] B25F *1/00*; A24F *27/00*

U.S. Cl. 206—102 **9 Claims**



1. A combination match safe, knife and strikers comprising; a container, means for closing said container, means for sealing said container, a knife, said knife having a blade portion and a base portion, said base portion being substantially perpendicular to one end of said knife blade, said base portion and said knife portion having means cooperating with said container and said means for closing said container in a first and second position, said first position being one in which said knife blade is enclosed and sealed in said container, said second position being one in which said knife blade is exposed on the outside of said container, said base portion having a striking surface, and a second striking surface affixed to the outside surface of said container.

4,944,393

ANIMAL REPELLENT TRASH BAG

Doris J. Cappuzzo, 19813 E. 47th Terr. Ct., and John D. Cappuzzo, 2812 S. 5th, both of, Blue Springs, Mo. 64015

Filed Jun. 1, 1989, Ser. No. 360,056

Int. Cl.[5] B65D *30/22*, *33/28*

U.S. Cl. 206—205 **1 Claim**

1. An animal repellent trash bag comprising,

an elongate flexible bag with an upper bag perimeter defining an opening, the opening including a closure means operatively associated therewith for selective closure of the bag, and

a covering means securable to an interior surface of the bag spaced above a floor of the bag wherein the covering is securable to the interior surface in a first position to define a compartment enclosing a quantity of animal repellent and deodorizing granules therein, and

the covering means removable from the bag to expose the granules and direct a deposit of the granules interiorly of the bag, and

wherein a covering means includes a cover strip, and the cover strip including a first adhesive surface formed at least about a perimeter of the cover strip on an interior surface of the cover strip, and

wherein the first adhesive surface is securable to a second adhesive surface of complementary configuration with the first adhesive surface formed on the interior surface of the trash bag, and

wherein the closure means includes a layer of the trash bag

overfolded about the upper perimeter to define a discontinuous conduit, the discontinuous conduit including an elongate flexible drawstring of a predetermined finite length, and

wherein the cover strip is adhesively secured about its entire interior surface to overlie the overfolded layer and the interior surface of the trash bag, and the overfolded layer including a series of apertures therein, and the conduit including the animal repellent and deodorizing granules whereupon removal of the cover strip enables the granules to be directed through the apertures for deposit interiorly of the bag.

4,944,394

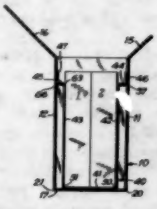
CIGARETTE CARTON INSERT

Christopher J. Campbell, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 10, 1988, Ser. No. 205,120

Int. Cl.[5] B65D *5/48*

U.S. Cl. 206—256 **22 Claims**



1. A blank for forming an insert for attachment to a standard size cigarette carton for laterally positioning smaller than standard size cigarette packages within a standard size cigarette carton for stamping by tax marking machines designed for use with standard size cigarette packages contained in standard size cigarette cartons, said blank comprising:

a bottom panel defined by a front score line, a rear score line parallel to said front score line, and first and second sides transverse of said front and rear score lines;

a front wall panel connected to said bottom panel at said front score line, and further defined by a front top score line, and first and second sides transverse of said front and front top score lines;

a front spacer connected to said front wall panel at said front top score line, and further defined by a front spacer score line parallel to said front top score line, and first and second sides transverse of said front top and front spacer score lines;

a front attachment tab connected to said front spacer at said front spacer score line, and further defined by a front margin and first and second sides transverse of said front spacer score line and said front margin;

a rear wall panel connected to said bottom panel at said rear score line, and further defined by a rear top score line, and first and second sides transverse of said rear and rear top score lines;

a rear spacer connected to said rear wall panel at said rear top score line, and further defined by a rear spacer score line parallel to said rear top score line, and first and second sides transverse of said rear top and rear spacer score lines; and

a rear attachment tab connected to said rear spacer at said rear spacer score line, and further defined by a rear margin and first and second sides transverse of said rear spacer score line and said rear margin.

8. In an erected cigarette carton having parts thereof defining a carton bottom panel, opposing front and rear carton wall panels, a top wall structure and right and left end wall structures;

said carton bottom panel defined by a carton bottom front score line, a carton bottom rear score line parallel to said carton bottom front score line, and first and second carton bottom sides transverse of said carton bottom front and rear score lines;

said front carton wall panel connected to said carton bottom front score line, and further defined by a front top margin parallel to said carton bottom front score line and first and second carton front sides transverse of said carton bottom front score line and said front top margin; and

said rear carton wall panel connected to said carton bottom rear score line, and further defined by a rear top margin parallel to said carton bottom rear score line and first and second carton rear sides transverse of said carton bottom rear score line and said rear top margin,

the combination with said carton of an insert having parts thereof defining an insert bottom panel, opposing front and rear insert wall panels, front and rear spacers, and front and rear attachment tabs;

said insert bottom panel defined by an insert bottom front score line, an insert bottom rear score line parallel to said insert bottom front score line, and first and second insert bottom sides transverse of said insert bottom front and rear score lines;

said front insert wall panel connected to said insert bottom panel at said insert bottom front score line, and further defined by a front top score line, and first and second insert front sides transverse of said insert bottom front score line and said front top score line;

said front spacer connected to said front insert wall panel at said front top score line, and further defined by a front spacer score line parallel to said front top score line, and first and second front spacer sides transverse of said front top score line and said front spacer score line;

said front attachment tab connected to said front spacer at said front spacer score line, and further defined by a front margin and first and second front attachment tab sides transverse of said front spacer score line and said front margin;

said rear insert wall panel connected to said insert bottom panel at said insert bottom rear score line, and further defined by a rear top score line, and first and second insert rear sides transverse of said insert bottom rear score line and said rear top score line;

said rear spacer connected to said rear insert wall panel at said rear top score line, and further defined by a rear spacer score line parallel to said rear top score line, and first and second rear spacer sides transverse of said rear top score line and said rear spacer score line; and

said rear attachment tab connected to said rear spacer at said rear spacer score line, and further defined by a rear margin and first and second rear attachment tab sides transverse of said rear spacer score line and said rear margin,

wherein the separation between said insert bottom front and rear score lines is less than the separation between said carton bottom front and rear score lines, and said front and rear attachment tabs are attached, respectively, to said front and rear carton walls.

4,944,395

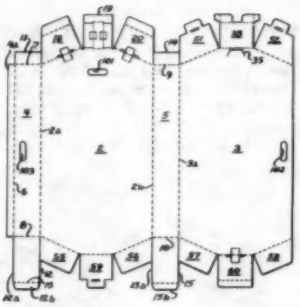
GARMENT BOX

David D. Coursen, Garland, Tex., assignor to Gaylord Container Corporation, Deerfield, Ill.

Filed Sep. 23, 1988, Ser. No. 248,681

Int. Cl.[5] B65D *5/08, 85/18*

U.S. Cl. 206—288 **26 Claims**



1. A garment box formed from a unitary blank of corrugated paper board including a hanger apparatus for holding hangers, comprising:

a. a front wall and a back wall disposed parallel to each other;

b. a first side wall extending parallel to a second side wall, said first and second side walls disposed perpendicularly between said front wall and said back wall;

c. a foldable first flap extending from the top of said front wall, said first flap rotatable inwardly toward said back wall along a first fold line located at the top of said front wall to form such hanger apparatus, said first flap comprising:

(i) an engaging portion for securing said first flap to said back wall;

(ii) a hanger bar portion having a first score line and a second score line, both extending perpendicularly from said first fold line to said engaging portion, said first and second score lines dividing said hanger bar portion into three segments; and

(iii) a third score line parallel to said first fold line dividing said engaging portion and said hanger bar portion;

d. means on said back wall for receiving and supporting said engaging portion of said first flap;

e. a foldable second flap extending from the top of said back wall, said second flap rotatable inwardly toward said front wall along a second fold line located at the top of said back wall; and

f. means for securing said second flap, whereby said first flap forming said hanger apparatus is folded inwardly along said first fold line and downwardly along said first, second and third score lines to form said hanger bar for supporting hangers, said engaging portion is secured in the means for receiving and supporting on said back wall, and said second flap is folded inwardly along said second fold line

and over said first flap and secured to said front wall so that any hangers placed on said hanger bar portion are secured between said flaps.

4,944,396

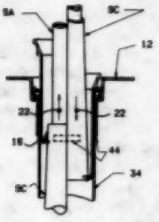
CLUB REMOVAL INDICATOR

Mark Larkin, 419 Northgate, Lindenhurst, Ill. 60046

Filed Mar. 20, 1989, Ser. No. 325,950

Int. Cl.[5] A63B *55/04*

U.S. Cl. 206—315.6 **12 Claims**



1. A device for indicating the absence of golf clubs, each of which has a shaft, a head and a grip, from a golf bag having an open top, said device comprising:

a substantially planar golf bag insert member having a plurality of apertures extending therethrough, each of said apertures being constructed and arranged for telescopic reception and support of an individual golf club and separation of said head portion of said golf club from the head portion of the other golf clubs when said golf clubs are positioned in said apertures;

attachment means for attaching and supporting said insert member in said golf bag in a parallel position to said open top of said golf bag;

a plurality of tubular indicator members, each of said indicator members having an outside diameter substantially equal to the inside diameter of said apertures, whereby each of said tubular indicators may be slidably positioned in an aperture;

stop means for retaining said tubular indicator members within said apertures of said insert member when said tubular members are slid upwardly or downwardly; and

means associated with said tubular insert members for engaging said grip of said golf club when said golf club is inserted or removed from said golf bag, wherein said means associated with said tubular insert members for engaging said grip of said golf club comprises one or more fingers extending inwardly from said tubular indicator member proximate the bottom portion thereof, said flexible fingers being adapted to flexibly engage said grip of said golf club, whereby sliding movement of said golf club during removal of said golf club from said golf bag causes said tubular indicator member to be drawn outwardly and extend from said insert member, thereby visually indicating the absence of the golf club associated with said aperture, and wherein insertion of said golf club causes said tubular indicator member to be depressed back into said aperture of said insert member.

4,944,397

DISPOSABLE COVERED NEEDLE FOR SYRINGE

Ernest C. Miller, Jacksonville, Fla., assignor to University Medical Center, Inc., Jacksonville, Fla.

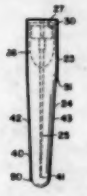
Continuation-in-part of Ser. No. 197,143, May 23, 1988, Pat. No. 4,886,503. This application Sep. 29, 1989, Ser. No. 414,283

Int. Cl.[5] B65D *85/24*

U.S. Cl. 206—365 **16 Claims**

1. A throw-away covered needle for releasable attachment to a syringe having a short tubular inlet/exit pipe, said covered needle including a needle member having a hollow needle with a free end and an encased end, said encased end being embedded in a socket having a top opening recess to engage said inlet/exit pipe and a passageway to connect said recess to the hollow of said needle; a cover member that is an elongated sheath enclosing said needle and pivotably attached to said socket and having an elongated lengthwise narrow opening structured and adapted to permit said needle to pass therethrough when said cover member is pivoted away from enclosing said needle; and a manually strippable adhesive tape attached to the outside of said cover member and to said socket so as to cover said narrow opening in said cover member and said top opening of said recess in said socket.

10. A safety covered needle for use on a medical syringe having a short tubular spout; said covered needle comprising a needle member and a cover member pivotally connected to



said needle member; said needle member including cup-shaped head with an interior recess with an upwardly facing opening adapted to frictionally engage said spout, a hollow needle having a free end and having the other end embedded in said head, a passageway in said head joining said recess and said other end of said needle; said cover member being an elongated sheath having an upper open end and a lower closed end and a longitudinal axis corresponding to the hollow of said needle, an elongated narrow opening extending from said open end to a closed end adjacent said lower end of said sheath; pivot means located adjacent said head and said open end of said sheath structured and adapted to permit said sheath to pivot away from said needle to expose said needle; and a manually strippable tape adhesively attached to said sheath and said head to cover said elongated narrow opening and the opening of said interior recess in said head.

4,944,398

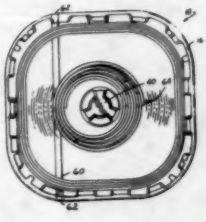
STACKABLE NESTABLE TRAY WITH CENTRAL WEIGHT BEARING HUB

Edward W. Gatt, Richmond, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 1, 1989, Ser. No. 401,678

Int. Cl.[5] B65D *21/04*

U.S. Cl. 206—507 **6 Claims**



1. A tray for transporting coiled weather stripping comprising:

a generally rounded body portion, said body portion having a bottom wall and an upstanding continuous sidewall, said bottom wall including a top surface and a bottom surface, said sidewall having an inner surface and an outer surface, said sidewall including a plurality of spaced radially inwardly extending step-like protrusions on said inner surface of said sidewall and forming corresponding radially inwardly extending indentations in the outer surface of said sidewall, said sidewall extending vertically above said inwardly extending step-like protrusions, said inwardly extending protrusions including upper surfaces defining a co-planar surface; a central hub portion extending from said bottom wall in an upstanding direction and being hollow in cross-section and opening at said bottom surface of said tray, said central hub portion including a plurality of radially outwardly extending central hub portion protrusions, thereby providing in the hollow underside of said central hub portion a corresponding plurality of radially outwardly extending indentations having walls extending therebetween, said weather stripping being coiled about the central hub portion in the space between the central hub portion and the sidewall, said central hub portion acting as a stop to help retain the weather stripping in its coiled orientation to reduce the possibility of damage of said weather stripping due to lateral movement during shipping, said tray being stackable with a tray of like configuration in a first position wherein portions of said bottom wall between said inwardly extending protrusions of the inner surface of said tray rest on the upper surfaces of the plurality of step-like inwardly extending protrusions of said tray of like configuration and the walls extending between the outwardly extending indentations provided in the hollow underside of said central hub portion rest on the radially outwardly extending central hub portion protrusions of said tray of like configuration, wherein the weight contained in said tray is distributed in stacking between said central hub portion and said plurality of inwardly extending protrusions of said sidewall and is nestable with said tray of like configuration when rotated to a second position wherein said plurality of radially inwardly extending protrusions of the inner surface of said tray nests into the plurality of radially inwardly extending indentations of said outer surface of said tray of like configuration and said plurality of radially outwardly extending central hub portion protrusions nest into the plurality of radially outwardly extending indentations provided in the hollow underside of the central hub portion of said tray or like configuration.

4,944,399

CONTAINER WITH INTEGRAL FOLDABLE HANDLE

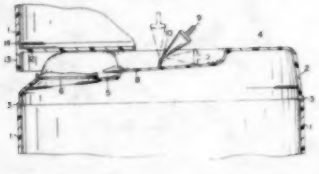
Cornelis A. Ten Bruggencate, Alphen; Andréas N. Montijn, Hillegom, and Gerrit J. Van Keimpema, Woerden, all of Netherlands, assignors to Koniklijke Emballage Industrie Van Leer B. V., Amstelveen, Netherlands

Filed Apr. 10, 1989, Ser. No. 335,278

Claims priority, application Netherlands, Apr. 11, 1988, 8800929

Int. Cl.[5] B65D *21/02, 23/28*

U.S. Cl. 206—509 **1 Claim**



1. A stackable container for a pourable liquid comprising:

a hollow cylindrical body structure having a longitudinal axis and forming a side wall of the container,

a bottom wall joined at an outer edge with the side wall structure near the bottom edge thereof,

a top wall structure joined at its periphery with the top edge of the hollow body structure and forming a top wall for the container, said top wall structure having a recessed portion formed in the central region of the top wall for receiving a folded handle and a closable pouring orifice formed adjacent the outer edge of the top wall, said recessed portion having an upper edge and a bottom surface disposed a predetermined distance below the upper edge, and

a bail-type handle having legs integrally molded with the bottom surface of the recessed portion of said top wall structure from synthetic resin material and arranged to be swingable about a pivot axis located near said bottom surface and extending perpendicular to the longitudinal axis of said body structure and perpendicular to the plane of symmetry of said body structure through said longitudinal axis and and through the axis of said pouring orifice, said handle being dimensioned to be entirely received within said recess portion when swung downwardly and as released from a mold having a normal position in which the legs extend upwardly in a plane which makes a sharp angle with said longitudinal axis and the handle extends above the upper edge of the recessed portion to facilitate easy gripping of the handle, the transitional portion of the legs with the bottom surface of the recessed portion being sufficiently resilient to swing upwardly from its normal position when the handle is gripped to lift the container and to be urged downwardly to a substantially horizontal position against the bottom surface of the recessed portion to facilitate stacking of like containers and in each case to return to said normal position upon removal of the applied force.

4,944,400

SELF-SUPPORTING STORAGE, SHIPPING AND DISPLAY ASSEMBLY

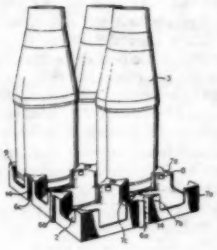
Elco T. J. M. Van Onstein, and Antonius C. G. Leebeek, both of Brussels, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 22, 1988, Ser. No. 234,852

Claims priority, application United Kingdom, Aug. 28, 1987, 8720422

Int. Cl.[5] B65D *21/00*; A47G *19/00*

U.S. Cl. 206—509 **11 Claims**



1. A self-supporting storage shipping and display assembly including a horizontally layered stack of semi-rigid compound trays which are coextensive with each layer and filled with containers, wherein the upper surface of each compound tray is equipped with upward surface holding means for holding the bottoms of said containers such that adjacent containers are in contact with one another along their side edges without exerting any pressure on each other when placed therein, and wherein the bottom surface of each compound tray is equipped

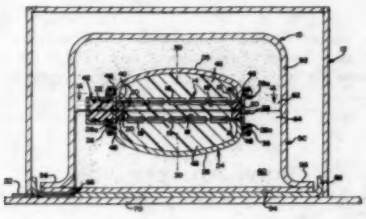
with downward surface holding means for holding the tops of containers on a subjacent compound tray, such that said containers are maintained in a substantially vertical position, wherein the improvement comprises: each compound tray being formed by a plurality of coplanar individual trays, said individual trays having cooperating interlocking elements along contiguous vertical side edges, said interlocking elements being self-centering and adapted for interengagement by relative movement only in the horizontal plane, said assembly further comprising means for preventing separation of said interlocking elements during transportation whereby to interlock each individual tray with an adjacent individual tray to form said compound tray.

4,944,401

CRASH SURVIVABLE ENCLOSURE FOR FLIGHT RECORDER

Johannes B. Groenewegen, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Sep. 28, 1989, Ser. No. 413,805
Int. Cl.[5] B65D *81/02, 85/30*
U.S. Cl. 206—521 **68 Claims**



31. A crash survivable enclosure for an information storage device, comprising:

filler means around said device for absorbing external heat employing the heat of fusion of a meltable filler and physically supporting said device; and

metal shell means around said filler means for protecting said device against external penetration and shock forces.

4,944,402

PYRAMID COSMETIC CONTAINER

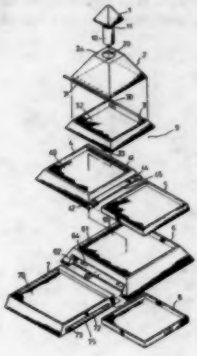
Shui-Kuan Wu, Tainan, Taiwan, assignor to Fong Yang Plastic Co., Ltd., Tainan, Taiwan

Filed Jan. 3, 1990, Ser. No. 460,528
Int. Cl.[5] B65D *6/06*
U.S. Cl. 206—581 **4 Claims**

1. A pyramid cosmetic container of a pyramid shape having a base and a plurality of sloping side walls upwardly meeting at a point and comprising:

a base housing of a truncated pyramid in shape including a first compartment defined by a base and a plurality of upstanding side walls; a second compartment defined by a base and a plurality of upstanding side walls and slidably mounted to the first compartment such that in a first position said second compartment covers the first compartment and such that in a second position the second compartment enables access to the first compartment; and a third compartment defined by a base and a plurality of upstanding side walls and slidably mounted to said second compartment and adapted to be slide in a direction perpendicular to the moving direction of the second compartment relative to the first compartment such that in a first position the third compartment covers the second compartment and such that in a second position the third compartment enables access to said second compartment;

a top housing of a truncated pyramid in shape having a base hingedly connected to and adapted to cover the third compartment of the base housing and a top plate formed with a hole and a passage defining a chamber extending downwardly from the hole; and



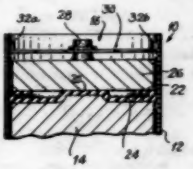
a lipstick unit retained in said passage, including a handle portion of a pyramid in shape seating on the top plate of the top housing and a container portion inserted in the passage.

4,944,403

SHOCK MOUNT CONTAINER

Herbert W. LeKuch, New York; Herbert S. Kulik, Dix Hills, both of N.Y., and Nicholas J. Lucia, Jr., West Caldwell, N.J., assignors to Vibration Mountings & Controls, Inc., Bloomingdale, N.J.

Filed Dec. 4, 1989, Ser. No. 445,377
Int. Cl.[5] B65D *43/04*
U.S. Cl. 206—594 **7 Claims**



1. A shock-resistant container for objects placed therein comprising: a container body having a peripheral side wall, said container being dimensioned to receive a shock-sensitive object therein; a cover; and an elastomeric element dimensioned to be placed within said container upon the top of said inserted object and extending substantially across the inside diameter thereof in a non-wall-contacting configuration therewith, said elastomeric element being of generally planar configuration and having a flexible, upwardly-extending, peripheral lip and a central shock-absorbing pedestal; said cover being engageable with said elastomeric element whereby said peripheral lip engages said side wall and said cover is in contact with said pedestal, said elastomeric element being retained in a contents-sealing and shock-absorbing configuration between said cover and said object.

4,944,404

FRAME STRUCTURE

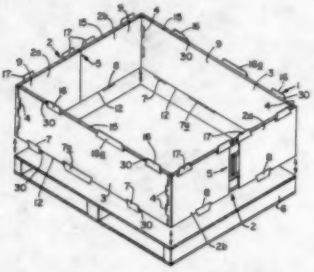
Peter L. Mead, Middlewich, Great Britain, assignor to Lin Pac Mouldings Limited, Birmingham, Great Britain

Filed Mar. 31, 1989, Ser. No. 331,497

Claims priority, application United Kingdom, Apr. 8, 1988, 8808272.2

Int. Cl.[5] B65D *19/00*

U.S. Cl. 206—600 **16 Claims**



1. A frame structure having an open top and an open bottom and which is adapted to be mounted on a base to form an enclosed upstanding plastics retaining wall; the retaining wall having a top edge and a bottom edge so that two similar frame structures can be mounted one on the other to form a hollow column with the bottom edge of the upper structure sitting on the top edge of the lower structure; peripherally spaced upwardly extending flanges on the wall adjacent to its open top and peripherally spaced downwardly extending flanges on the wall adjacent to its open bottom, the downwardly extending flanges being offset from the upwardly extending flanges on the respective walls whereby when two structures are mounted to form said hollow column the seated top and bottom edges are bridged by said upwardly and downwardly extending flanges to restrain the two frame structures from horizontal displacement relative to each other and wherein at least one of the upwardly extending flanges and at least one of the downwardly extending flanges have a profiled edge part, said profiled edge parts engaging between flanges of the two structures during location of the upper structure on the lower structure in forming said column to restrain the upper structure from lifting relative to the lower structure.

4,944,405

MULTI-CELLED ENCLOSED CARTON

John C. Buford, Madison, Wis., and Leslie H. Porter, Chebanse, Ill., assignors to Manville Corporation, Denver, Colo.

Filed Sep. 29, 1989, Ser. No. 415,161

Int. Cl.[5] B65D *5/48*

U.S. Cl. 206—614 **7 Claims**

1. A multi-celled carton, comprising:

four side panels connected to each other along fold lines, each side panel having an upper edge and a lower edge;

a bottom flap connected along a fold line to the lower edge of each of two opposite side panels, the bottom flaps forming a bottom panel;

cell-dividing flap means connected along a fold line to an edge of at least one of the bottom flaps opposite the fold line connected said one bottom flap to its associated side panel;

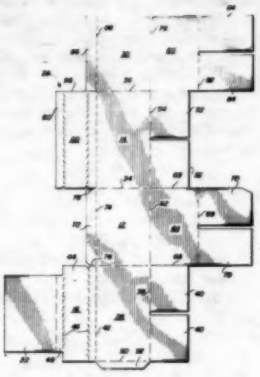
the cell-dividing flap means extending into the interior of the carton to divide the interior into two cells;

a top flap connected along a fold line to the upper edge of each of the other two opposite side panels, the top flaps forming a top panel closing the upper end of the carton;

means maintaining the top flaps in closed position; and

cell-dividing flap means connected along a fold line to an edge of at least one of the top flaps opposite the fold line connecting said one top flap to its associated side panel;

at least one of the top and bottom cell-dividing flap means including a slot, the other cell-dividing flap means extending through the slot to thereby enable the cell-dividing



flap means of said one top flap to extend on either side of the cell dividing flap means of said one bottom flap to divide the interior of the carton into four cells.

4,944,406

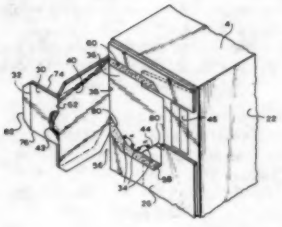
CARTON WITH POUR SPOUT

Sally A. Zehnal, Houston, Tex., assignor to Uncle Ben's Inc., Houston, Tex.

Filed Sep. 14, 1988, Ser. No. 244,136

Int. Cl.[5] B65D *5/70*

U.S. Cl. 206—621.4 **32 Claims**



1. A blank for forming a carton comprising:

(a) a back portion;

(b) first top and bottom inner flap portions connected to said back portion;

(c) first and second side portions connected to said back portion, said second side portion having:

(1) a pull tab cut therein, said pull tab having at least one free end;

(2) an orifice cover cut therein, said cover connected to said pull tab at a first hinge line and connected to said back portion at a second hinge line; and

(3) re-open means integral with said orifice cover;

(d) second top and bottom inner flap portions connected to said first side portion;

(e) third top and bottom inner flap portions connected to said second side portion;

(f) a front portion connected to said first side portion;

(g) top and bottom outer flap portions connected to said front portion; and

(h) a glue flap portion connected to said front portion at a bend score line, said glue flap portion having:
(1) a pull tab glue area; and
(2) an orifice notch cut therein located near said pull tab glue area.

4,944,407

PACKING CONTAINER

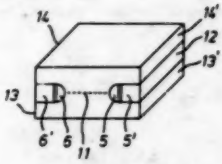
Harmut Thiele, Munich; Leo Gruber, Pentenried, and José Toral, Munich, all of Fed. Rep. of Germany, assignors to Reel/Frame 5189/0412 Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 8, 1989, Ser. No. 447,714

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 8815897[U]

Int. Cl.[5] B65D 5/54

U.S. Cl. 206—628 **4 Claims**



1. Square packing container, manufactured from a one-piece blank comprising a base and a lid portion and side wall surfaces located thereon, which can be connected to one another by means of connecting tabs, and wherein weakened lines are formed on the side wall surfaces, characterised in that the weakened lines (9, 9', 10, 10', 11) are formed approximately in the plane of symmetry of the side wall surfaces (3, 4) and that two perforated tabs (5, 6) are formed on at least one side wall (3), an adhesive tape (12) encircling the side wall surfaces being stuck on to extensions (5', 6') of the said perforated tabs (5, 6), each in the direction of the side edges (7, 8), said adhesive tape (12) connecting the side tabs (13, 13' and 14, 14') of the base portion (15) and the lid portion (16) with one another.

4,944,408

OPENING ARRANGEMENT FOR CARDBOARD PACKAGE

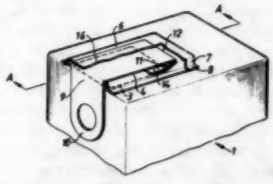
Hans Rausing, Wadhurst Park, England, assignor to Tetra Pak Holdings & Finance S.A., Pully, Switzerland

Filed Nov. 15, 1989, Ser. No. 436,717

Claims priority, application United Kingdom, Nov. 16, 1988, 8826750

Int. Cl.[5] B65D 5/70

U.S. Cl. 206—628 **9 Claims**



1. An opening arrangement for a cardboard package of the type which has a package wall comprising a base layer of paper or cardboard having coatings of thermoplastic material on both sides and a tearing indication provided in the package wall enclosing at least parts of the desired opening area characterized by, on the one hand, a duct or pouring channel fixed to the said package wall, this pouring channel surrounding the said opening area so as to cover it, on the other hand a pull-out opening means arranged in the said pouring channel partially projecting from it and comprising parts which are inclinable in relation to the principal direction of the means and which are adapted so that with their one boundary edge they rest against, and are fixed to, the said opening area adjoining the tearing indication which delimits the opening area, and that the said opening means is adapted so that when a tensile force is exerted on the opened means substantially parallel with the longitudinal direction of the pouring channel, the said inclinable parts will be pressed in inclined position against the inside of the pouring channel and exert a pressure directed substantially against the package wall within the parts of the opening area where the said inclinable parts of the opening means are fixed, with the object of breaking up the said tearing indication and, on continued pulling out of the opening means from the pouring channel, remove the wall part or parts of the package wall present within the opening area after tearing up of the said tearing indication.

4,944,409

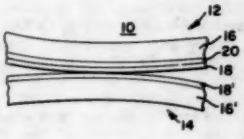
EASY OPEN PACKAGE

David A. Busche, Neenah, and David H. Bostian, Sheboygan, both of Wis., assignors to Curwood, Inc., Oshkosh, Wis.

Filed Feb. 10, 1988, Ser. No. 309,321

Int. Cl.[5] B65D 65/26

U.S. Cl. 206—632 **17 Claims**



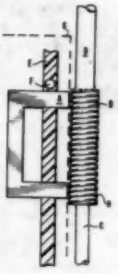
1. An easy open package adapted to be heat sealed to a closed condition to contain and protect product disposed therein, but which is readily openable by application of force, said package including a first package wall having a first thermoplastic polymeric film construction comprising a first outer layer, a first inner sealant layer of polymer and a first tie layer disposed between said first outer layer and said first inner sealant layer, said tie layer comprising a combination of polybutylene and one other constituent and being peelably bonded to one of either said first outer layer or said first inner sealant layer and being permanently bonded to the outer layer to which said tie layer is not peelably bonded, a second package wall joined at a portion of its perimeter to said first package wall, said second package wall having a second thermoplastic polymeric film construction with a second inner sealant layer of the same polymer as, and disposed adjacent to, said first inner sealant layer of said first film construction, whereby when said first inner sealant layer of said first film construction is heat sealed to said adjacent second inner sealant layer of said second film construction along a heat seal, a bond is formed between said inner sealant layers having greater bond strength than the peelable bond between said tie layer and said one layer of said first film construction to which said tie layer is peelably bonded such that upon application of force to open said package, the first and second inner sealant layers will remain bonded together and opening will take place between the peelably bonded layers at said heat seal.

4,944,410

HYGIENIC SUSPENSION FOR DENTAL OR MEDICAL INSTRUMENTS

Richard C. Goet, Prinsenellaan 53, 2024 LM Amsterdam, Netherlands

Filed Jun. 15, 1988, Ser. No. 206,776
Claims priority, application Netherlands, Jun. 16, 1987, 8701398
Int. Cl.[3] A61C 1/02
U.S. Cl. 433—28 13 Claims



1. A connection device for use with a treatment instrument, comprising:

an elongated instrument tube having an instrument connecting end and a control connecting end;

a magnetizable member disposed at said instrument connecting end;

means for controlling the instrument, said control means having a first portion connected to said control connecting end of said instrument tube;

a second portion of said control means including a magnetizing means disposed to magnetically interact with said magnetizable member thereby to control the operation of the instrument; and

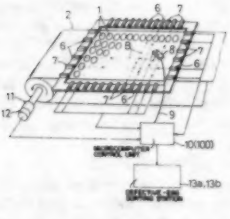
a replaceable means for covering said control means, said instrument tube and said magnetizable member, said covering means comprising at least one sheet which insulates said control means, said instrument tube and said magnetizable member from contamination.

4,944,411

POSITION INDICATOR DEVICE FOR CONVEYED OBJECT

Junzo Fukushima, Tsuyama, Japan, assignor to Kyowa Machinery Co., Ltd., Okuyama, Japan

Filed Dec. 27, 1988, Ser. No. 290,228
Claims priority, application Japan, Feb. 8, 1988, 63-26869
Int. Cl.[5] B07C 5/00
U.S. Cl. 209—705 2 Claims



1. A position indicator device for conveyed objects comprising:

a checking area disposed relative to a conveyor having a conveying passage where a plurality of objects are unidirectionally conveyed while aligned in a conveying direction and a direction normal to the conveying direction;

an indicator manually movable to a position of a target object of conveyed objects within said checking area for indicating a position of the target object;

indicator-position detecting means for detecting a two-dimensional position of said indicator within said checking area;

said checking area includes a plurality of light beam emitters operable together to project beams of light in a grating form within said checking area and a plurality of oppositely disposed beam receivers each operable to receive the light beam from a corresponding light beam emitter;

said indicator acting as a beam-blocking member for blocking the beam of light transmitted between the light beam emitters and corresponding beam receivers; and

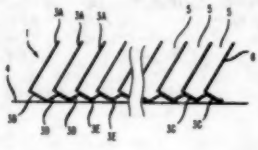
said indicator-position detecting means detects said target object position within said checking area based on positional information of the beam receivers blocked by said indicator.

4,944,412

ELEMENT FOR SLANTED DESK TOP RACK

Jean C. Daigre, Villemur sur Tarn, France, assignor to Societe Dacota (S.A.), Villemur sur Tarn, France

Filed Sep. 12, 1988, Ser. No. 243,455
Claims priority, application France, Sep. 19, 1987, 87 12664
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—11 9 Claims



1. An ordering element for documents and other materials comprising a plate which is bent for defining the following sections: a backing; a foundation base adjoining the backing and forming an intersection angle with the backing;

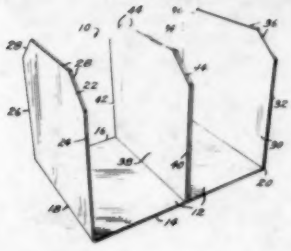
a connection wall adjoining the foundation base and forming an intersection angle with the foundation wall, wherein the connection wall is bent in the same direction as the backing relative to the foundation base in the way of forming with the said backing and the said foundation base a U with unequal wings and wherein the intersection angle between the foundation base and the connection wall is provided for resting on a board surface or on another ordering element; a support surface adjoining the connection wall and forming an intersection angle with the connection wall and provided for receiving another ordering element, wherein the support surface is bent in a direction opposite to the foundation base relative to the connection wall, wherein the support surface and the connection wall form an intersection angle, and wherein the intersection angle between the foundation base and the connection wall is provided for resting on a board surface or on another ordering element and wherein an edge perpendicular to the support surface is provided for resting on said board surface in such a way that the backing be inclined above the foundation base.

4,944,413

BOOK SUPPORT APPARATUS

Wallace J. Connell, 604 W. 12th St., Juneau, Ak. 99801

Filed Jun. 24, 1988, Ser. No. 211,296
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—42 **6 Claims**



1. Book support apparatus, comprising:

a substantially planar base of first predetermined thickness defining exposed front and rear edges of said first thickness and further defining directly opposed left and right-end edges of said first thickness, each of said exposed front and rear edges defining visually discernible upper and lower margins;

a first substantially planar support of second predetermined thickness defining exposed front, rear and top edges of said second thickness, said first support permanently attached to and projecting upwardly from said left-end edge at an angle of substantially ninety degrees with said base;

a second substantially planar support of third predetermined thickness defining exposed front, rear and top edges of said third thickness, said second support permanently attached to and projecting upwardly from said right-end edge at an angle of substantially ninety degrees with said base; and

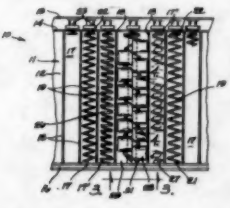
at least a third substantially planar support of fourth predetermined thickness defining exposed front, rear and top edges of said fourth thickness, said third support permanently attached to and projecting upwardly from said base between said left and right-end edges and at an angle of substantially ninety degrees with said base.

4,944,414

SHELF ASSEMBLY FOR VENDING TUBULAR PRODUCTS

Henry J. Albright, West Des Moines, Iowa, assignor to Fawn Engineering Corp., Des Moines, Iowa

Continuation of Ser. No. 114,724, Oct. 30, 1987, abandoned, which is a continuation of Ser. No. 922,060, Oct. 22, 1986, abandoned. This application Feb. 23, 1989, Ser. No. 314,489
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—59.2 **2 Claims**



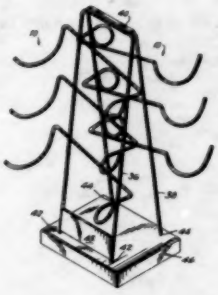
1. In a vendor comprising a cabinet having a front door, at least one shelf in the cabinet, the forward end of the shelf being spaced rearward from the door to provide a discharge space, a helix on the shelf extending in rear-to-front direction with respect to the cabinet and adapted to receive tubular items to be vended between its convolutions, the items being interiorly unobstructed so that the items may be received between its convolutions extending across the helix from one side thereof to the other, means for rotating the helix to advance the items toward the forward end of the shelf and discharge the forwardmost item off the forward end of the shelf to drop down into the discharge space, and panels extending in rear-to-front direction on the shelf at opposite sides of the helix defining a path of travel for the items, the improvement comprising the provision of placing the helix at midpoint between the panels, the panels being spaced a distance to accommodate the width of a pair of items to be dispensed placed end-to-end between the panels, the panels being so located relative to the helix that the items are supported at their outer ends by the panels and at their inner ends by each other, the portion of the convolutions of the helix on one side of the longitudinal center thereof being capable of supporting one rear-to-front row of tubular items, and the portions of the convolutions of the helix on the other side of the longitudinal center thereof being capable of supporting another rear-to-front row of tubular items in a relationship staggered relative to said one rear-to-front row, whereby the helix is capable of supporting the tubular items in a staggered relationship, thereby providing a forwardmost item for discharge alternately from each row.

4,944,415

BOTTLE SUPPORT APPARATUS

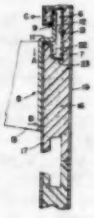
Max A. Orbach, 473 FDR Dr., New York, N.Y. 10002

Filed Mar. 2, 1989, Ser. No. 317,876
Int. Cl.[5] A47B 73/00
U.S. Cl. 211—75 **1 Claim**



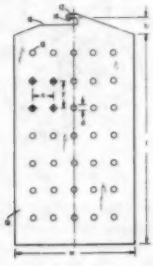
1. An apparatus for supporting a plurality of bottles in a slanted position, comprising a mounting frame including a pair of spines each in an inverted U-shape having a pair of parallel arms joined by an upper horizontal portion, said spines being pivotly mounted together at said upper horizontal portions, the arms thereof being supported in a spaced-apart position by a base, each of said spines having a plurality of bottle support units affixed thereto in a spaced-apart, parallel relationship, each of said bottle support units comprising a neck-embracing, substantially closed loop portion supported by a horizontally-extending arm, a generally curved bottle body supporting portion and a central portion joining said arm and body supporting portion in a spaced-apart relationship whereby a bottle may be retained in a slanted position thereby, each of said bottle support units being formed of a continuous length of a wire-like material.

4,944,416
LIGHT-WEIGHT SLOT-WALL DISPLAY PANEL
Robert J. Petersen, 9789 SE. 41st St., Mercer Island, Wash. 98040, and Marvin C. Lemmerman, 2234 SE. 8th Pl., Renton, Wash. 98055
Filed Nov. 21, 1988, Ser. No. 273,837
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—87 **20 Claims**



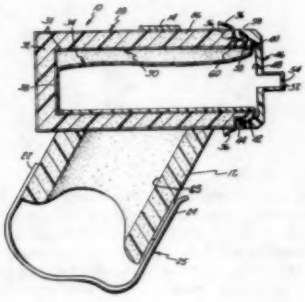
1. A slotted panel for display of merchandise of all types detachably mounted on a surface thereof comprising:
- a flat board shaped core member having substantially planar front and back opposing faces with a plurality of spaced substantially parallel longitudinal grooves opening into said front face, said back face being adapted for attachment to a substantially vertical support surface,
- said grooves being configured to accept and support hanger accessories thereon for supporting brackets cantilevered from said front face, and
- said core member comprising molded-board expanded plastic foam having a density of from 3–6 pounds per cubic foot.

4,944,417
SEPARATOR FOR STORED GARMENTS
David Datlow, Chevy Chase, Md., assignor to J.D.'s, Washington, D.C.
Filed Apr. 14, 1988, Ser. No. 183,534
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—184 **15 Claims**



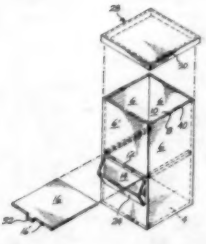
1. A device for separating garments hung adjacently on a common support rod comprising:
- a flat separator element having a portion of a size and shape selected to extend substantially across the width and length of said hung garments, said flat separator element being integrally formed at a first end to have a transverse extension supportable by said support rod so as to hold said separator element vertically below said support rod; and
- a restraining clamp means mounted over said transversal extension for clamping to said support rod while restraining sliding of said separator element along said support rod from a selected location thereon, wherein said restraining clamp means is movable in infinitely variable increments along the longitudinal axis of said support rod.

4,944,418
SOFT BABY BOTTLE
Kenneth O. Wallace, 862 Inglehart Ave., St. Paul, Minn. 55104
Filed Jun. 23, 1989, Ser. No. 370,613
Int. Cl.[5] A61J 9/00, 9/06, 11/04
U.S. Cl. 215—100 R **23 Claims**



1. A soft, pliable baby bottle for use as a feeding device for children, wherein the bottle has a soft construction and is substantially deformable in shape, the baby bottle comprising:
- a flexible, removable inner liner having one open end for containing a quantity of a liquid;
- a soft, elastomeric nipple having an opening for delivering liquid at a limited rate and for preventing spillage;
- a bottle wall comprising a flexible, foamed elastomeric material having an annular space for receiving the flexible inner liner; and
- a seal formed between the bottle wall and the flexible inner liner as well as the nipple and the flexible inner liner, in response to the assembly of said liner and nipple with said wall.

4,944,419
COMPARTMENTALIZED REFUSE CONTAINER
John W. Chandler, 131 NW. 55th St., Seattle, Wash. 98107
Filed May 8, 1989, Ser. No. 349,325
Int. Cl.[5] B65D 1/24, 25/06
U.S. Cl. 220—1 T **12 Claims**



1. In combination,
- an elongated upright container for holding refuse and the like,
- said container having a closed bottom, a sidewall structure including a set of side walls upstanding about the bottom,

and a top opening defined by the upper edges of the side walls,

said container being adapted to be loaded and unloaded through said top opening by a person standing to the sides of the container,

said side walls of the container defining a hollow bin for the refuse between the closed bottom and top opening of the container, and said bin having a pair of apertures therein which open through the sidewall structure to the outside of the container at levels below the top opening thereof,

a divider panel for forming a false bottom in the container,

one of said apertures being rectangular and disposed at an intermediate level between the top opening and bottom of the container, to form a horizontally extending slot for the divider panel,

said divider panel being removably insertable in the bin through the slot and said container having means disposed about the bin at the level of the slot to support the panel crosswise of the bin at said level,

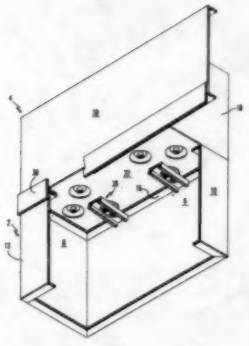
the other of said apertures being disposed at a level relatively below the slot and adapted to form an entry port for loading refuse in the portion of the bin below the slot, whereby two types of refuse can be loaded in the relatively top and bottom portions of the bin, above and below the slot, segregated from one another by the panel, and then the relatively top and bottom portions of the bin can be separately unloaded through the top opening of the container, to preserve the integrity of the respective types of refuse, by unloading the relatively top portion of the bin through the top opening, and then removing the panel through the slot to open the relatively bottom portion of the bin to the top opening of the container.

4,944,420

OIL-FILLED TRANSFORMER HOUSING

Herbert S. Adkins, Vienna, and Darrell D. Harris, Fulton, both of Mo., assignors to ABB Power T&D Company, Blue Bell, Pa.

Filed Jan. 6, 1989, Ser. No. 294,074
Int. Cl.[5] H02Q *3/08*
U.S. Cl. 220—3.3 **9 Claims**



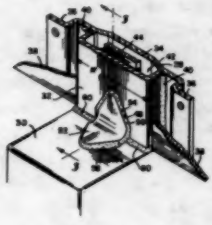
1. In a transformer housing assembly including a tank and a base supporting the tank, and a plurality of fastening devices securing the tank and based together, the tank being arranged to contain a body of oil and a transformer, and the tank having a bottom whose lower surface delimits a plane, and the base having an open top provided with an inwardly directed peripheral flange which supports the tank, the improvement wherein said tank bottom is formed to have a plurality of nonperforated upwardly recessed regions, each region having an outer edge located at said bottom plane and an interior portion located at a selected height above said bottom plane, and each said fastening device comprises: an attachment member permanently fastened to said tank bottom at said interior portion of a respective recessed region, said attachment member having a height not greater than said selected height and being provided with a screw thread; an elongate clamping member extending across said respective recessed region and having two opposed ends one of which bears against said tank bottom and the other of which ends bears against said base flange, said clamping member being provided with an elongate opening between said ends; and bolting means having a thread mating with said thread on said attachment member, said bolting means extending through said opening and engaging in said threaded bore for urging said other end of said clamping member against said flange in order to clamp said tank and base together.

4,944,421

ANGLE REINFORCEMENT

Howard J. Yurgevich, Monticello, Ind., assignor to Rosby Corporation, Monon, Ind.

Filed Jun. 19, 1989, Ser. No. 368,410
Int. Cl.[5] B65D *6/32, 6/34, 90/02*
U.S. Cl. 220—1.5 **8 Claims**



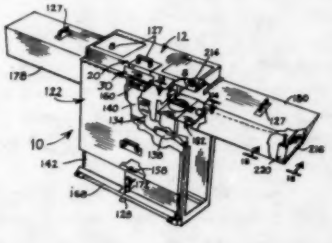
1. In a container having a floor and walls including a plurality of vertically oriented posts joined to the floor, at least one of the posts comprising a generally box-shaped structure including an inner post wall and a reinforcement plate situated adjacent the floor within the box-shaped structure and fixed to the inner post wall, the improvement comprising: a notch in the inner post wall adjacent the floor exposing an inner surface of the reinforcement plate, and joining means for joining the reinforcement plate inner surface to the floor.

4,944,422

EXPANDABLE HOME PACKAGE DELIVERY BOX

Harold O. Aurness, 5808 Knox Ave. No., Brooklyn Center, Minn. 55430, and Thomas G. Mahler, 3841 Unity Ave. North, Robbinsdale, Minn. 55422

Filed Nov. 29, 1989, Ser. No. 442,851
Int. Cl.[5] B65D *25/00*
U.S. Cl. 220—20 **7 Claims**



1. An expandable delivery box of an upright, rectangular shape comprising a box-shaped hinged cover at the top with

two integrated shallow boxes with lock-free lids with handles for casual deliveries; which top cover is kept locked, before a delivery, by a latch hook member of a spring-biased sliding latch base within a cover lock housing on the underside of the top cover, which latch hook extends down to a catch bar in a main lock housing on the unit frame; a pull-key, carried only by a delivery person, inserted into a keyhole of the main lock housing and onto a section of the sliding latch base designed to accommodate the key teeth when turned, allows a pulling action to unlock the top cover housing from the main lock housing; said main lock housing also comprising a first combination lock accessible from outside the unit, a first automatic receipt marking means activated by closing the top cover, which action automatically locks the top cover at the combination lock; a second receipt marking means handpressed by the delivery person; a spring-biased delivery signal automatically activated by closing the top cover only after a delivery; locking means for a front expansion box member of the unit comprising a step-lock base plate with a latch to hold the expansion member closed, means to automatically hold the locking means open while the expansion member is in use and automatically release when closed, a key receiving member plus a separate key, or release tool, carried only by a delivery person, to unlock the step-lock; a said front expansion box comprising hinged, folded sides with bottom placed tabs to hold a hinged, folding bottom member, a hinged, folding cover with a handle and a combination lock latch on its front side, a vertical front door assembly, with handles, on a frame hinged to the folding sides, which frame is secured in folded position at the bottom by a spring-biased lever on the main frame of the unit, with the doors of the front door assembly overlapping with an overlapping flap plate on the back of one of the doors featuring a locking means not accessible from the front but only when the expansion box cover is up, locking the doors at the top and bottom frame members, a second combination lock on the face of the top expansion frame member to receive the combination latch from the cover; a hinged support means to hold the front of the expansion box off the ground and kept in a retracted position by a spring-biased latch; a third receipt marking means on the inside of one of the front doors and further comprising, in the main part of the unit, covered hinged extension arms folded into each narrow side of the unit for accommodating long packages when extended horizontally and secured in closed position automatically by locking means inside the unit which can be unlatched by a delivery person when the top cover is open, comprising hinged, handless doors on each outer end with automatic locking means unlatchable only from the inside, including means for automatically pushing the doors ajar from the inside, a hinged bridge-plate assembly on each inside end of the arms for bridging the gap left underneath when the arms are extended; wherein after a delivery has been made to the unit, the delivery person cannot reopen the unit with the pull-key or release tool until it has been opened by the receiver using the combination lock and, conversely, the unit cannot be reopened by the receiver using the combination lock until another delivery has been made by a delivery person.

4,944,423

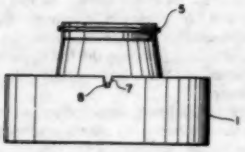
CRACKER AND CONDIMENT BOWL

Mary J. Clark, R.D. 3 Box 114, Claysville, Pa. 15323, and Paul M. Hankison, 106 Oakwood Rd., McMurray, Pa. 15317

Filed Dec. 4, 1989, Ser. No. 445,370

Int. Cl.[5] A47J *43/00*

U.S. Cl. 220—20 **10 Claims**



1. A bowl for packets of crackers and condiments, said bowl having an outer rim on the top of which at least one slot is provided having a razor blade piece embedded in the bottom of the slot for facilitating opening of said packets.

4,944,424

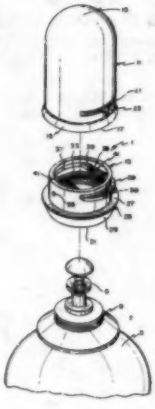
SAFETY CAP ASSEMBLY

Theodore N. Wood, Jr., Pole 257, R.D. 3, Box 121, Harvey's Lake, Pa. 18618

Filed Jan. 9, 1990, Ser. No. 462,468

Int. Cl.[5] B65D *25/00*

U.S. Cl. 220—85 P **12 Claims**



1. A safety cap assembly for protecting the valved discharge end of a pressurized cylinder provided with an existing threaded cap ring flange, which assembly comprises:

(a) a cap including a cylindrical-shaped open bottom end and a first pair of circumferential slots formed in opposed wall portions thereof;

(b) a cylindrical-shaped collar including a second pair of circumferential slots formed in opposed wall portions thereof and an internal threaded wall portion for threaded engagement with a threaded cap ring flange of a pressurized cylinder;

(c) a pair of locking tabs carried by the collar and spring means biasing the tabs outwardly through the second pair of slots; and

(d) the collar being slidably and rotatably receivable within the open end of the cap to position the first and second pairs of slots in alignment and permit the locking tabs to

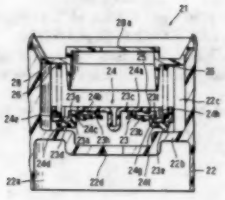
extend through the first pair of slots and detachably secure the cap to the collar.

4,944,425

FUEL CAP

Joji Kasugai, Ichinomiya; Satoshi Toki, Inazawa, and Norikazu Hosokawa, Aichi, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 23, 1988, Ser. No. 235,446
Claims priority, application Japan, Oct. 24, 1987, 62-269049
Int. Cl.[5] B65D *51/16*
U.S. Cl. 220—203 **3 Claims**



1. A fuel cap comprising:

(a) a cap body to be installed to a filler neck of a fuel tank and provided with a fluid flow path and with an annular projection projecting inward at an inner circumference of said fluid flow path;

(b) an annular valve body made of a rubber-like elastic material and provided with an outer circumferential lip element projecting from an outer circumferential edge thereof and pressed against said annular projection, with an inner circumferential lip element projecting from an inner circumferential edge thereof in reverse direction to said outer circumferential lip element, with a base portion arranged and held between said inner and outer circumferential lip elements, and with an inside arm member connecting said base portion and said inner circumferential lip element, said base portion being cylindrical, located at an intermediate position in radial direction between said inner and outer lip elements and having an annular recess in the upper side of the outer circumference thereof, said inside arm member extending from the upper side of said base portion inward in radial direction and having said inner circumferential lip element projecting upward and formed at the inner circumferential edge of said body;

(c) an outside arm member extending from the lower side of said base portion outward in radial direction and having said outer circumferential lip element projecting downward and formed at the other circumferential edge of said body;

(d) a disk-shaped valve support plate disposed at the rear side of said outer circumferential lip element and provided with a support portion for supporting said base portion of said valve body and with a seal member for pressing against said inner circumferential lip element when said valve body is supported, said valve support plate being spaced from said inside arm member to form a gap therebetween;

(e) communication means extending through said support plate radially outward of the portion of said seal member pressed against said inner circumferential lip element for communicating that side of said valve body from which said outer lip element projects with the opposite side of said valve support plate when said inner circumferential lip element is separated from said seal member, said plate having a disk-shaped inside plate and an annular outside plate connected to said inside plate through a plurality of coupling members extending from the outer circumferential edge of said inside plate and having L-like cross-sections to provide a gap between said inside plate and said outside plate to form said communication means, and said recess in said base portion being engaged with the inner circumferential edge of said outside plate when said valve body is assembled with said valve suport plate;

(f) means for biasing said valve support plate that said outer circumferential lip element is pressed against said annular projection; and

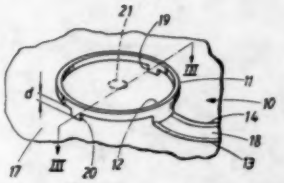
(g) movement restriction means disposed in said gap between said inside arm member and said valve support plate for restricting movement of said inside arm member towards said valve support plate.

4,944,426

CLOSURE DEVICE FOR A PACKAGING CONTAINER

Lars-Erik Piltz, Dalby, Sweden, assignor to AB Akerlund & Rausing, Sweden

Filed Feb. 10, 1989, Ser. No. 309,414
Claims priority, application Sweden, Feb. 16, 1988, 8800514
Int. Cl.[5] B65D *41/32*
U.S. Cl. 220—270 **8 Claims**



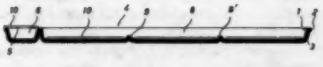
1. An irreversibly openable closure for a packaging container comprising a substantially planner member containing an easy opening arrangement including a grip and a tearing strip defined by at least one tearing denotation emanating from said grip, said grip being integrally molded with said tearing strip and said grip having at least one additional connection portion attached to said closure, said connection portion of said grip having a predetermined size and shape adapted to maintain a substantially portion of said grip at a certain distance from said closure such that said grip is easily gripable, and wherein the operation of said grip is substantially normal to said substantially planner member.

4,944,427

DISPOSABLE TRAY FOR MEDICAL USE AND METHOD OF MAKING THE SAME

Hideaki Yamada, Kamakura; Masato Kimura; Masataka Oka, both of Fujisawa, and Kohta Saito, Yokohama, all of Japan, assignors to Nippon Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,230
Claims priority, application Japan, Sep. 21, 1987, 62-143086; Dec. 4, 1987, 62-305761; Jul. 26, 1988, 63-184610
Int. Cl.[5] A61B *19/00*
U.S. Cl. 220—406 **16 Claims**



1. A disposable tray for medical use, comprising:

a tray body formed of a coextrusion multi-layer sheet, said sheet comprising at least two layers formed of thermoplastic resin, said layers including an upper surface layer that can be peeled from the next underlying layer;

recessed portions provided in said tray body for containing liquid medicines therein; and

an instrument resting section provided on said tray for resting medical instruments thereon, said instrument resting section being provided with at least one ridge for supporting medical instruments.

4,944,428

APPARATUS FOR THE AUTOMATIC DETERMINATION OF A CONTINUOUS BULK MATERIAL THROUGHPUT BY MEANS OF A CONTINUOUS BALANCE

Bruno Gmür, Boppartstrasse 32, 9014 St. Gallen, and Bernd Kühnemund, Primelweg 4, Flawil, both of Switzerland

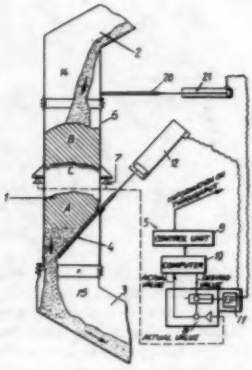
PCT No. PCT/EP86/00187, § 371 Date Nov. 6, 1986, § 102(e) Date Nov. 6, 1986, PCT Pub. No. WO86/05875, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 27, 1986, Ser. No. 948,350

Claims priority, application Switzerland, Apr. 4, 1985, 01485/85

Int. Cl.[5] G01G *11/14*

U.S. Cl. 222—55 **7 Claims**



1. Apparatus for automatic control of throughput of a bulk material through a continuous balance, comprising:

(a) a weighing vessel having an inlet opening and an outlet opening;

(b) weigh measuring means having an input and an output, said input being operatively connected with said weighing vessel;

(c) an adjustable of closure member positioned in an outlet region of said weighing vessel and connected thereto for closing and opening the outlet opening of said weighing vessel, said closure member having means to movably position the closure member in said weighing vessel to define said outlet opening of said weighing vessel so as to adjust a shape and a size of said outlet opening to ensure in it's opened position a continuous mass flow of said bulk material within and out of said weighing vessel;

(d) position indicating means connected with said closure member and having an output;

(e) a dosing member positioned upstream of said weighing vessel and adapted for control by the continuous balance as a function of weight changes monitored by said weighing measuring means;

(f) control means having a program for controlling the throughput of bulk matearial, said control means having a first input, a second input, a first output, and a second output, said first input being operatively connected with said output of said weight measuring means, said second input being operatively connected with said output of said indicating means, said first output being operatively connected with said closure member to set a position of the closure member to meet a programmed product-dependent opening position with respect to a desired throughput, and said second output being operatively connected with a control input of said dosing member to adjust the position of the dosing member such that an output signal of the weight measuring means is kept within a given range by the program of said control means, the limits of said range being chosen to lie between a first and a second output signal value, the first value corresponding to the lowest filling level of the weighing vessel at which said continuous mass flow is still possible while the second value corresponds to the maximum filling level, thereby using the weighing vessel with a set shape and size of said outlet opening thereof to ensure desired throughput.

4,944,429

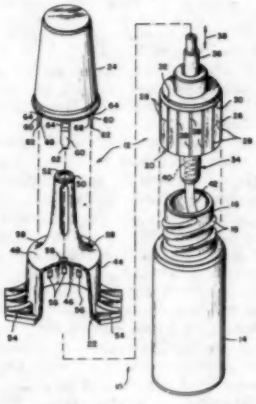
MANUALLY-OPERABLE SPRAY DISPENSER WITH LOCKING MECHANISM

Keith H. Bishop, River Vale, and William S. Blake, Linwood, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 28, 1987, Ser. No. 90,490

Int. Cl.[5] B67D *5/32*

U.S. Cl. 222—153 **17 Claims**



1. Spraying apparatus for withdrawing a dosage of liquid from a container and discharging the dosage of liquid in the form of a spray, comprising a cap removably attachable to a container of liquid; pumping means for pumping liquid from a container attached to said cap, said pumping means including a stem extending through said cap such that said stem is reciprocable relative to said cap between an extended position and a retracted position; actuating means for actuating said pumping means, said actuating means being movably mounted over and about said cap such that said actuating means is reciprocable relative to said cap between an extended position and a retracted position and said actuating means including spraying means for spraying liquid delivered thereto by said stem upon the movement of said stem from its extended position to its retracted position in response to the movement of said actuating means from its extended position to its retracted position; covering means for covering said spraying means when said covering means is mounted on said actuating means; and locking means for locking said actuating means in a locked position when said covering means is mounted on said actuating means, said locked position corresponding generally to said extended position of said actuating means, whereby said locking means inhibits the inadvertent actuation of said pumping means by said actuating means, said locking means including a plurality of openings provided in an upper surface of said actuating means and a plurality of resilient legs depending from said

covering means, each of said legs being sized and shaped so as to extend through a corresponding one of said openings and having a lower end which is positioned in close proximity to an upper edge of said cap.

4,944,430

FLUID DISPENSER

Lothar Graf, Rielasingen-Worblingen; Leo Maerte, Sipplingen, and Thomas Skorka, Radolfzell, all of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 649,514, Sep. 11, 1984, Pat. No. 4,694,977. This application Aug. 7, 1987, Ser. No. 83,669

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339180

Int. Cl.[5] B65D *83/00*

U.S. Cl. 222—259 **32 Claims**

1. A fluid dispenser for dispensing a fluid, said dispenser comprising:

a storage container (2) defining a storage space (28) for a volume of the fluid;

a piston pump (1) to be operated over a pump stroke cycle from an initial position along a pump stroke to an end position and back to the initial position along a return stroke, said piston pump (1) having a pump piston (4) displaceable relative to a pump cylinder (3) for evacuation of a pump chamber (15) defined by said pump cylinder (3) together with the pump piston (4), said pump chamber (15) being connected via an outlet duct to an external outlet (18);

said pump cylinder (3) having an inlet (11) for the fluid, said inlet (11) being defined by a portion of said pump cylinder (3) connected to the storage space (28);

control means for opening and closing said inlet (11) dependent upon the pump stroke,

wherein means are provided for preliminarily sucking the fluid into a vicinity of said inlet (11) during part of said pump stroke cycle, thereby immersing said inlet (11) in preliminarily-sucked fluid during evacuation of said pump chamber (15) until the pump stroke reaches opening of said inlet (11).

4,944,431

TRIGGER SPRAYER WITH MULTI-FUNCTION PISTON

William S. Blake, 14 Georgetown Ct., Linwood, N.J. 08221

Filed Sep. 23, 1988, Ser. No. 248,418

Int. Cl.[5] B67D *5/40*

U.S. Cl. 222—276 **22 Claims**

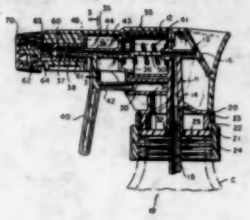
1. A dispenser pump to be mounted on a container for dispensing product from the container, comprising:

means defining a pump chamber for receiving product from the container through an inlet passage;

means defining an outlet chamber for receiving product from the pump chamber;

outlet passage means extending from the pump chamber to the outlet chamber for conveying product from the pump chamber to the outlet chamber; and

pump means including primary piston means and secondary piston means reciprocable in the pump chamber and outlet chamber, respectively, said primary piston means being operable to decrease the volume of the pump chamber upon a pressure stroke of the pump means to thereby pressurize product in the pump chamber, and said secondary piston means being operable upon said pressure stroke to enlarge the volume of the outlet chamber and create a



low pressure therein upon initial movement of the pump means on a pressure stroke for drawing product from the pump chamber and through the outlet passage to the outlet chamber, whereby flow of product from the pump chamber to the outlet chamber is enhanced and prime of the pump is maintained during initial movement on a pressure stroke.

4,944,432

APPARATUS FOR FACILITATING THE FILLING OF SPRAY DEVICES

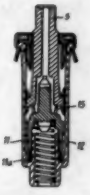
Claude Jouillat, Montigny sur Avre, France, assignor to S.T.E.P., Sur-Aure, France

Filed Jan. 26, 1989, Ser. No. 301,789

Claims priority, application France, Feb. 5, 1988, 88 01367

Int. Cl.[5] B05B *11/00*

U.S. Cl. 222—321 **5 Claims**



1. Apparatus for facilitating the filling of a spray device, the spray device being constituted by a receptacle and an extraction and projection pump mounted on the receptacle, wherein the pump is of the precompression type and comprises a body, a delivery piston disposed within said body and movable along an axis, a valve member having a pin which is operable between a valve open position and a valve closed position in which that pin is held pressed against a seat by a spring whose characteristics determine the degree of precompression, said seat being formed around the axis of the delivery piston of the pump, the improvement comprising:

projections formed on the valve member and in contact with said piston for holding the valve in an open position.

4,944,433

SEDIMENT BAFFLE FOR VALVES OF PRESSURIZED CONTAINERS

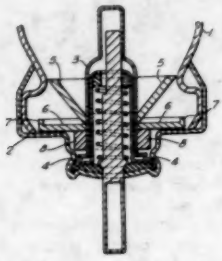
Adolf Knecht, Mainz; Ottfried Dank, Ingelheim Am Rhein, and Hans-Hermann Weil, Gau-Bickelheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,880

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802498

Int. Cl.[5] B65D *83/14*; G01F *11/32*

U.S. Cl. 222—402.2 7 Claims



1. In a valve for dispensing metered doses from a pressurized dispensing container, which container and valve dispenses doses in an inverted position, the valve having a valve housing holding the valve and attaching the valve to the dispensing container so as to create a space between the valve housing and the walls of the dispensing container, the improvement which comprises an element disposed about the valve housing and extending radially therefrom toward the wall of the dispensing container so as to substantially close the space between the wall of the dispensing container and the valve housing, the element having a raised peripheral portion adjacent the wall of the dispensing container.

4,944,434

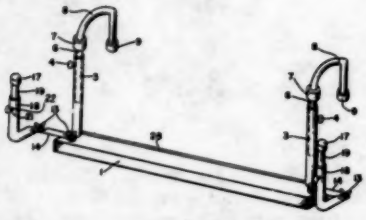
AUTOMOBILE PORTABLE HAULER

Kenneth B. Hamilton, 1408 Granville Rd., Westfield, Mass. 01085

Filed Jun. 30, 1989, Ser. No. 374,259

Int. Cl.[5] B60R *9/00*, *11/00*

U.S. Cl. 224—42.45 R 14 Claims



1. A portable hauler adapted to carry a load on the side of an automobile comprising a horizontal main frame member having a front and rear portion, a first U-shaped means adapted to fit over an open window of an automobile, means for connecting said first U-shaped means to said main frame member at one end thereof, a second U-shaped member adapted to fit over the open window of an automobile, means for connecting said second U-shaped member to said main frame member at the other end thereof, a first cradle forming horizontal member, adjustable means for connecting said first cradle forming horizontal member to the front portion of said main frame member, opposite the first U-shaped member, a first L-shaped member having a top and a bottom portion and being connected to the first cradle member, adjustable means connected to said first cradle forming horizontal member, a second cradle forming horizontal member, adjustable means for connecting said second cradle forming horizontal member to the front portion of said main frame member and opposite the second U-shaped member, a second L-shaped member having a top and a bottom portion and being connected to the second cradle member, adjustable means connected to said second cradle forming horizontal member, whereby a cradle is formed between the U-shaped members and the L-shaped members on said main frame for carrying an elongated load on the side of an automobile.

4,944,435

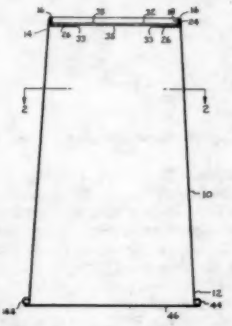
DISPOSABLE SEASONING OR CONDIMENT DISPENSER

James Lee, 8008 Nagle Ave., N. Hollywood, Calif. 91605

Filed May 8, 1989, Ser. No. 348,374

Int. Cl.[5] A47G *19/24*

U.S. Cl. 222—565 7 Claims



1. A condiment dispenser comprising:

an upstanding essentially cylindrical cardboard tube having a lower end and an upper end;

the upper end of said tube having a radially inturned section, followed by an axially reversed section spaced radially inwardly from the tube inner surface to form an internal annular slot;

a first annular flat disc having a peripheral flange extending into said slot so that an edge of the flange contacts the radially inturned section and the upper disc face is spaced below the lower edge of said axially reversed section;

and a second flat perforated disc seated against the upper face of said annular disc with its peripheral edge extending into the space below the lower edge of the axially reversed section.

4,944,436

GARMENT HANGER COVER

Harold W. Moen, and Darcy A. Moen, both of 74 Noonan Road, Regina, Saskatchewan, Canada S4V 0Z5

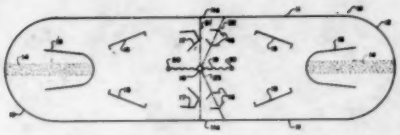
Filed Feb. 17, 1989, Ser. No. 12,037

Int. Cl.[5] A47G *25/20*, *25/14*

U.S. Cl. 223—98 5 Claims

1. A cover for a garment hanger of the type having a pair of diverging arms and an integral hook supporting such arms comprising, a fold formed generally rectangular normally flat flexible sheet of material having a central opening therein capable of permitting the passage of said hook therethrough, a main fold line on the central transverses axis dividing the sheet into opposite end portions, two further fold lines in one of said

end portions, wedge shaped locking tongues formed by cuts generally transverse to and crossing the further fold lines, lips formed by a cut on the portion opposite to the one containing the locking tongues, which when pivotally displaced permit



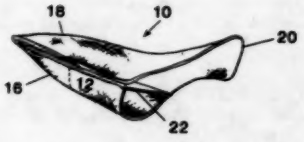
entry and provide coverage of the locking tongues in a unique and expeditious manner, such easily formed and positively locked cover providing a complete support for a garment on said hanger.

4,944,437

SEWING THIMBLE

Nathaniel Calvert, Rochester, Minn., assignor to IN Motion, Inc., Minneapolis, Minn.

Filed Sep. 12, 1988, Ser. No. 243,482
Int. Cl.[5] D05B *91/04*; A41D *13/00*
U.S. Cl. 223—101 9 Claims



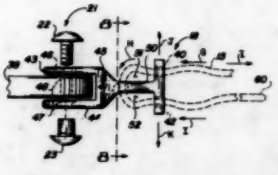
1. A needle work thimble comprising:
(a) a pliable member folded upon itself and hemmed to form an elongated envelope surrounding an interior cavity;
(b) an elastic member secured interiorly of said cavity in the hem that forms said cavity;
(c) at least one rigid planar member secured interiorly of said cavity to one surface of said pliable member; and
(d) wherein said cavity is sized to mount over at least the outer phalanx of a finger and is rotatable thereabout.

4,944,438

SHOULDER STRAP APPARATUS FOR CARRYING WEAPONRY ON THE PERSON

Richard N. Gallagher, 4311 W. Van Buren, Phoenix, Ariz. 85043

Filed Feb. 27, 1989, Ser. No. 315,551
Int. Cl.[5] F41C *33/02*; A44B *11/10*
U.S. Cl. 224—206 13 Claims



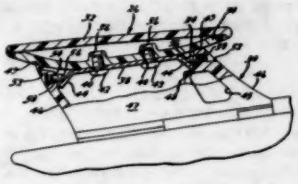
1. A shoulder strap support apparatus for carrying weaponry on the person, said apparatus including
(a) a weaponry container normally carried at the side beneath the shoulder of the person;
(b) elongate strap means made of substantially stiff material having a first end and a second end and normally extending upwardly from said container over the side of the chest, over the shoulder, and downwardly over the back of the person to said container;
(c) first connector means for attaching said first end to said container;
(d) second connector means for attaching said second end to said container;
at least one of said first and second connector means comprising unitary fastener means including
(e) a body including
(i) first, second and third spaced apart slots for slidably frictionally receiving one of said ends of said strap means, and
(ii) a mediate member extending between
said second slot, and
said first and third slots,
and including an end extending between and terminating intermediate said first and third slots; and,
(f) a head interconnecting said body and said container;
said body being shaped and dimensioned such that one of said first and second ends
(g) extends continuously sequentially through said first, second and third slots, and loops around said mediate member;
(h) is adjacent said mediate member at points intermediate
(i) said first and second slots, and
(ii) said second and third slots;
(i) frictionally slidably engages each of said slots;
(j) loops outwardly away from at least a portion of said mediate member and inwardly through said second slot and is spaced away from said portion of said mediate member, said looping of said strap through said second slot and said spacing of said strap away from said mediate member facilitating the frictional engagement of said strap by at least one of said first and third slots; and,
(k) passes only once through each of said slots.

4,944,439

ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 207,062, Jun. 13, 1988, abandoned.
This application Nov. 28, 1989, Ser. No. 442,208
Int. Cl.[5] B60R *9/04*
U.S. Cl. 224—326 20 Claims



1. In an article carrier for carrying articles on a vehicle including at least one longitudinally extending support member adapted to be mounted on a generally horizontally extending body surface, a bracket having a first end mounted on the support member and extending upwardly to a second end and having means forming a cavity therein, and a cross bar extending laterally to the support member and disposed upon the second end of the bracket, a retaining assembly for retaining the cross bar to the bracket, said assembly comprising:
means forming a retaining member having a planar portion extending longitudinal and substantially parallel to the body surface and a flange at each end of said planar portion extending longitudinally and downwardly from the cross bar toward the body surface surface that said flange

is inclined relative to said planar portion, said reataining member being disposed within the cavity; and

means on the bracket at each longitudinal end thereof for cooperating with said flanges for preventing longitudinal and vertical movement of said retaining member relative to said bracket for retaining the cross bar to the bracket.

4,944,440

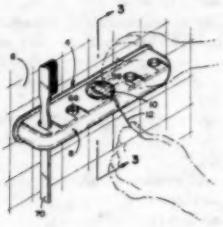
DISPOSABLE DENTAL FLOSS CASSETTE DISPENSER SYSTEM

Eugene J. Fortman, 2111 Telemark La., Rochester, Minn. 55901

Filed Feb. 27, 1989, Ser. No. 316,094

Int. Cl.[5] B65H *75/32*; A47B *81/02*; A61C *15/04*

U.S. Cl. 225—1 **11 Claims**



1. A method of dispensing dental floss, said method comprising the steps of:

(a) providing a dental floss dispenser for attachment to a surface, said dental floss dispenser including:

(i) self-contained disposable cassette housing means for enclosing dental floss gathered for storage therein prior to being dispensed therefrom, said self-contained disposable cassette housing means including a gathered supply of dental floss and opening means for withdrawing dental floss from said housing; and

(ii) a support member for attachment to the surface, said support member including support means for supporting and receiving said self-contained disposable cassette housing means and attachment means for attaching said support member to the surface;

(b) attaching the support member to the surface;

(c) engaging said self-contained disposable cassette housing means with said support means; and

(d) withdrawing dental floss from said self-contained disposable cassette housing means when said housing means are seated within said support means.

4,944,441

TAPE CUTTING DISPENSER

John W. Gana, 5077 Landisville Rd., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 946,954, Dec. 19, 1986, Pat. No. 4,807,789. This application Dec. 14, 1988, Ser. No. 284,188

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] B65H *35/04*

U.S. Cl. 225—16 **9 Claims**

1. An apparatus for dispensing predetermined lengths of tape which comprises:

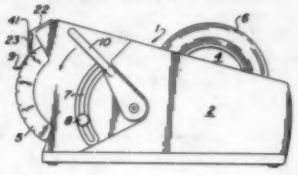
(1) a framed housing in which there is disposed a revolving tape drum for supporting a tape roll;

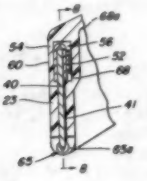
(2) a feeder wheel onto which said tape is dispensed;

(3) a lever arm for rotating said feeder wheel through a succession of sequenced movements so as to feed said tape incrementally onto the peripheral surface of said wheel;

(4) a cover assembly slidably engaged within grooved openings in said housing above said feed wheel, said assembly terminating in a vertical segment which includes a slotted aperture having two end openings for receiving a straight-edged blade;

(5) a spring means located within said slotted aperture; and





(6) a straight-edged blade positioned within said aperture and against said spring means to overcome variations in blade dimensions and a worn condition of said aperture.

4,944,442

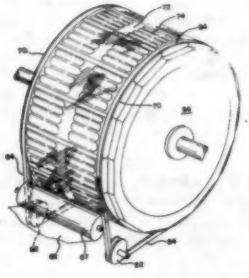
WEB RETENTION AND ADVANCEMENT MECHANISM

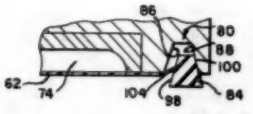
Raymond G. Buchko, Appleton, Wis., assignor to Curwood, Inc., Oshkosh, Wis.

Filed Oct. 6, 1988, Ser. No. 254,432

Int. Cl.[5] B65H *20/00, 5/02*

U.S. Cl. 226—171 **13 Claims**





1. A web retention and advancement mechanism for retaining a web upon a rotatable drum during an arcuate portion of its rotation; said drum being adapted to receive a web upon its outer surface; said mechanism comprising:

two spaced grooves formed on said drum, each groove having an inner groove defining wall, said drum inner groove defining walls being spaced apart from each other

a distance which is less than the axial width of the web; a pulley associated with each said groove and spaced from said drum in general alignment with its associated drum groove, each said pulley defining a groove including an inner groove defining wall, said pulley inner groove defining walls spaced apart a distance greater than the distance between said inner groove defining walls of said drum;

a pair of endless belts each one of which is positioned in a groove of said drum and a groove of one of said pulleys, each said belt being tensioned between said drum and pulley and being rotatable with said drum, each said belt having an inner annular surface in contact with a portion of said inner wall of one of said grooves in said drum to retain edges of the web in said grooves in said drum.

4,944,443

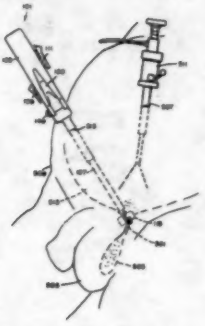
SURGICAL SUTURING INSTRUMENT AND METHOD

Robert R. Oddsen, Centerport, and Ralph Ger, Lake Success, both of N.Y., assignors to Innovative Surgical Devices, Inc., Westbury, N.Y.

Filed Apr. 22, 1988, Ser. No. 185,054

Int. Cl.[5] A61B *17/00*

U.S. Cl. 227—19 **58 Claims**



1. A surgical instrument for suturing an opening in internal body tissues of a patient from inside the body cavity of the patient, said instrument comprising:

elongate frame means for providing a superstructure for the instrument;

staple storing means on said frame means for temporarily storing at least one staple;

staple forming and ejection means at least in part movably mounted to said frame means for ejecting said staple from said stable storing means into the body tissues of the patient and deforming said staple from an open position to a closed position in which said staple holds together two pieces of body tissue on opposite sides of said opening;

first actuating means at least in part movably mounted to said frame means and connected to said staple forming and ejection means for moving at least a portion thereof;

tissue positioning means separate from said staple forming and ejection means and mounted to said frame means for gripping, approximating and temporarily holding in a stapling position said two pieces of body tissue prior to and during a stapling operation; and

second actuating means separate from said first actuating means for moving at least a portion of said tissue positioning means prior to said stapling operation, said second actuating means being at least in part movably mounted to said frame means and connected to said tissue positioning means.

4,944,444

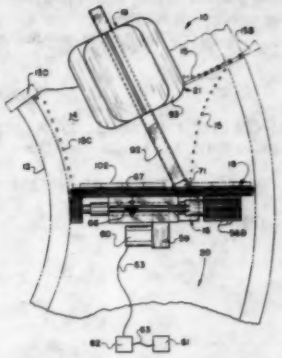
WELDING OR BURNING SHIELD

James S. Renner, Milford, Ohio, assignor to MK-Ferguson Company, Cleveland, Ohio

Continuation of Ser. No. 369,735, Jun. 22, 1989, abandoned. This application Jan. 18, 1990, Ser. No. 467,321

Int. Cl.[5] B23K *9/32, 28/02*; F16P *1/06*

U.S. Cl. 228—59 **18 Claims**



1. A portable shield for preventing welding or burning by-products and other foreign bodies traveling substantially along or across a pipe from contaminating the inside diameter of the pipe comprising:

a shield assembly for support within the pipe that spans across and contacts the inside diameter of the pipe and limits the movement of by-products and foreign bodies traveling substantially along the pipe; and

a splatter target that is connected to and extends from said support member for limiting the movement of welding by-products traveling across the inside diameter of the pipe.

4,944,445

METHOD FOR AUTOMATIC JOINING AND MACHINING

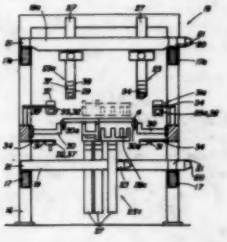
Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

Division of Ser. No. 925,000, Oct. 22, 1986, Pat. No. 4,893,398. This application Oct. 17, 1989, Ser. No. 422,582

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506314

Int. Cl.[5] B23K *37/02*

U.S. Cl. 228—102 **2 Claims**



1. A method for the automatic joining and machining of different assemblies, each assembly having at least one component contained in a workpiece carrier having a bearing arm, the method using a transfer line with a retoolable and reconfigurable work station, comprising: presorting parts for the

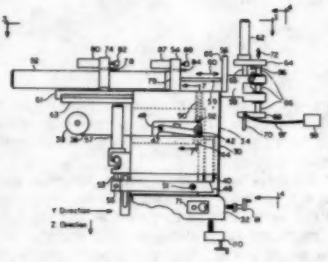
assembly and placing presorted parts on the workpiece carrier bearing arms in positions corresponding generally to a pre-arranged assembly position; delivering the assembly parts on the workpiece carrier bearing arms in a loose and unjoined condition to a work station; employing individual holding and clamping implements, associated with one of a plurality of tool carriers movable in at least two dimensions, at the work station to autmatically position the assembly parts into a precise predetermined joining position relative to other assembly parts; and, securing the assembly parts in a joining position, and thereafter completing at least one of lifting and welding the secured assembly parts.

4,944,446

AUTOMATIC PREFORM DISPENSER

Ted L. Thompson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Nov. 2, 1989, Ser. No. 430,257
Int. Cl.[5] B23K *3/06*
U.S. Cl. 228—102 **18 Claims**



1. An automatic preform dispenser apparatus for cutting and placing a predetermined length of preform on an integrated circuit (IC) package, comprising:

a. means for advancing a predetermined length of preform;

b. a blade and blade actuating means in the form of a first pneumatic cylinder positioned adjacent to the preform to cut a predetermined length of preform;

c. a vacuum operable preform pick-up tip operable between a pick-up location and an IC package;

d. means in the form of a second pneumatic cylinder to move the pick-up tip in a horizontal (Y) plane between a pick-up location and the IC package;

e. means in the form of a third pneumatic cylinder to move the pick-up tip in a vertical (Z) plane;

f. an adjustable XYZ table for supporting the automatic preform apparatus and providing micrometer adjustment in X, Y and Z directions; and

g. programmable means for controlling sequential operation of the apparatus.

4,944,447

BONDING VERIFICATION PROCESS INCORPORATING TEST PATTERNS

John R. Thome, Fort Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1989, Ser. No. 330,039
Int. Cl.[5] B23K *1/19*
U.S. Cl. 228—103 **31 Claims**

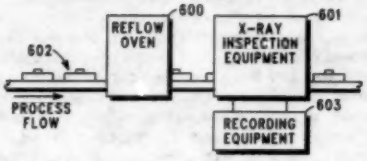
1. A method of bonding verification, which comprises the steps of:

(a) positioning at least one bonding test pattern on a substrate;

(b) applying a bonding agent to said at least one bonding test pattern;

(c) applying the bonding agent to components and the substrate;

(d) altering the applied bonding agent state to adhere the components to the substrate; and



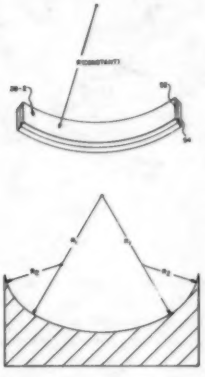
(e) inspecting the altered state of the bonding agent applied to said at least one bonding test pattern.

4,944,448

COMPOSITE ELECTRON BEAM TARGET FOR USE IN X-RAY IMAGING SYSTEM AND METHOD OF MAKING SAME

Kristian R. Peschmann, San Francisco, and Steve S. Shen, San Bruno, both of Calif., assignors to Imatron, Inc., South San Francisco, Calif.

Filed May 9, 1986, Ser. No. 861,416
Int. Cl.[5] B23K *20/02*
U.S. Cl. 228—173.2 **11 Claims**



1. A method of fabricating a composite structure including at least two metal sheets brazed together comprising the steps of preforming at least one of said metal sheets, assembling said metal sheets in a die having a preselected shape, and brazing the assembled metal sheets while in said die.

4,944,449

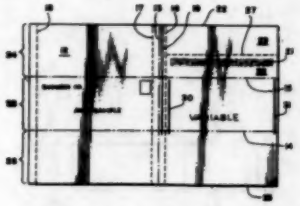
OVERSIZE LASER MAILER AND RETURN ENVELOPE AND METHOD

Eric Schmidt, Elgin, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 391,302, Aug. 7, 1989. This application Aug. 9, 1989, Ser. No. 391,300
Int. Cl.[5] B65D *27/06, 27/12*
U.S. Cl. 229—73 **3 Claims**

1. A folded single sheet mailer comprising a rectangular sheet having two long sides and two short sides, said sheet on one face being imprinted with variable information and static information on the other face, said sheet being folded on itself transverse to said long sides along a line offset from the middle

of said sheet to provide one fold ply extending beyond the other fold ply and with the variable information containing face positioned outwardly, a transverse line of perforation in said one ply in the portion extending beyond the other fold ply, a transversely extending glue line on said static information face in said extending portion between said transverse line of perforation and the adjacent short side, superposed lines of transverse perforation in said one fold ply and said other fold ply adjacent said transverse fold line, a transversely extending glue line on said other ply on said variable information containing face between said superposed lines of perforation and said fold line, said sheet being folded on itself along two spaced apart longitudinally extending fold lines to provide a sealed outgoing envelope openable by tearing along said lines of transverse perforation, said longitudinally extending fold lines being substantially equally spaced relative to the said long sides to provide three substantially equal side-by-side panels in said other ply, the middle of said three panels on said variable information face being equipped with transversely extending ribbons of adhesive adjacent to said transverse lines of perforation to provide a return envelope after said envelope is open.

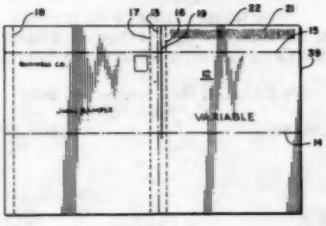


4,944,450

OVERSIZE LASER MAILER AND METHOD

Eric Schmidt, Elgin, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Filed Aug. 9, 1989, Ser. No. 391,302
Int. Cl.[5] B65D *27/06, 27/12*
U.S. Cl. 229—73 **3 Claims**



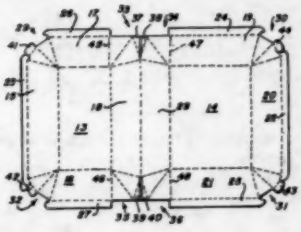
1. A folded single sheet mailer comprising a rectangular sheet having two long sides and two short sides, said sheet on one face being imprinted with variable information and static information on the other face, said sheet being folded on itself transverse to said long sides along a line offset from the middle of said sheet to provide one fold ply extending beyond the other fold ply and with the variable information containing face positioned outwardly, a transverse line of perforation in said one ply in the portion extending beyond the other fold ply, a transversely extending glue line on said static information face in said extending portion between said transverse line of perforation and the adjacent short side, superposed lines of transverse perforation in said one fold ply and said other fold ply adjacent said transverse fold line, a transversely extending glue line on said other ply on said variable information containing face between said superposed lines of perforation and said fold line, said sheet being folded on itself along two spaced apart longitudinally extending fold lines to provide a sealed envelope.

4,944,451

COMPARTMENTED FLANGED TRAY

Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 6, 1989, Ser. No. 446,795
Int. Cl.[5] B65D *5/48*
U.S. Cl. 229—120.17 **6 Claims**



1. A flanged tray for packaging, storing, heating and serving food prepared from a single blank of paperboard, said tray comprising multiple leakproof compartments with partitions between each adjacent pair of compartments, said flanged tray comprising:

(a) a base panel for each compartment formed by opposed score lines;

(b) upstanding side walls foldably attached to each base panel along said opposed score lines said side walls terminating at upper free edges wherein the adjacent walls of each pair of compartments are foldably attached to one another along their upper free edges to form partitions between each pair of compartments;

(c) flap extensions foldably attached to the upper free edges of all side walls of each compartment except the tray walls which form each partition to provide a peripheral flange around the tray;

(d) gusset panel corner closures foldably attached to the ends of said side walls at each corner of each base panel along paired score lines which extend from the intersection of said opposed score lines, said gusset panels being overlappingly bonded together and between said side walls to form leak proof corners for the respective compartments, said paired score lines being arranged at the gusset closures between the adjacent compartments to provide partition panels which extend substantially perpendicular from their respective base panels to lie in full face-to-face contact so that the paired compartments provide support for each other.

4,944,452

MULTIPLE PIZZA CONTAINER

Walter R. Kent, 1732 120th Ave., Allegan, Mich. 49010, and Terrence L. Guerrant, 2027 114th Ave., Otsego, Mich. 49078

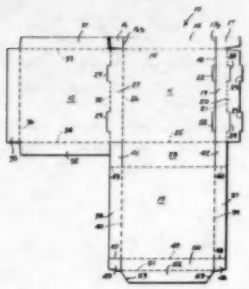
Filed Sep. 27, 1989, Ser. No. 413,238
Int. Cl.[5] B65D *5/48*
U.S. Cl. 229—120.21 **7 Claims**

1. A multi-compartmented box blank comprising,

a single "L" shaped blank including a top panel member, a floor panel member, and a middle panel member,

the floor panel member includes a first wall hingedly mounted coextensively to a top edge of the floor panel member, and a left side wall panel positioned medially of and hingedly coextensively mounted to the floor panel member and to the middle panel, and a bottom side wall

panel positioned medially of and hingedly mounted coextensively to the floor panel member and the top panel



member intermediate the top panel member and the floor panel member.

4,944,453

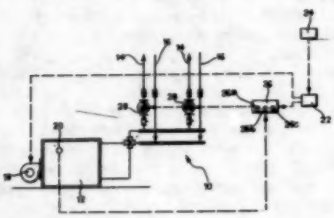
HEATING SYSTEM

Artemio Ronzani, Frazione Clou N.6, 11010 Sarre (Aosta), Italy

Filed Sep. 23, 1988, Ser. No. 248,014

Int. Cl.[5] F22B *35/00*

U.S. Cl. 237—8 R **3 Claims**



1. A space heating system including a boiler with which are associated a burner, inlet and delivery pipes for the liquid, at least one liquid circulation pump, and an electrical control panel connected to at least one ambient temperature sensor, characterised in that an electronic economiser device (26) is operatively associated with the electrical control panel (22) and comprises:

a central processing unit provided with an input connected to a sensor (20) of the temperature of the liquid in the boiler (12) and an output connected to the pump (28);

a first timer (26*a*) connected to the pump to control the duration of an operating cycle of the pump (28) in conjunction with the temperatures sensed by the ambient temperature sensor (24) and the boiler liquid temperature sensor (20), and

a second timer (26*b*) connected to the pump to control the duration of a non-operating cycle of the pump (28) independently of the temperature sensors (20,24).

4,944,454

HEATER, IN PARTICULAR VEHICLE AUXILIARY HEATER, WITH A TEMPERATURE SAFETY MECHANISM

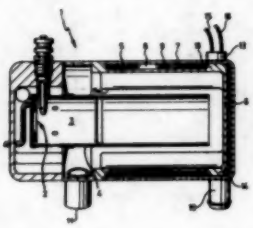
Friedrich Widemann, Munich; Guenter Kahnau, Soecking; Richard Kohse, Munich, and Dieter Raethel, Mittelstetten, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany

Filed Feb. 22, 1989, Ser. No. 313,081

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805610; Nov. 21, 1988, 3839244

Int. Cl.[5] B60H *1/02*

U.S. Cl. 237—12.3 C **23 Claims**



1. In a water type heater, for a vehicle auxiliary heater, of the type having a burner in a combustion chamber that is surrounded by a heat exchanger with a closed end facing away from the burner, the heat exchanger, in turn, being surrounded by a jacket casing in a manner creating a jacket space between the heat exchanger and the jacket casing through which a liquid heat exchange medium flows, and with a temperature safety means for shutting off the heater to prevent damage of temperature-sensitive parts, due to overheating; the improvement wherein the temperature safety means is a contact type temperature sensor, and wherein said temperature safety means is provided with means for supporting it exteriorly of the jacket casing and for connecting it in a heat-conducting manner with the heat exchanger.

4,944,455

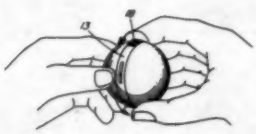
AIR TREATING DEVICE

Wilhelm M. H. Haust, Toronto, and Charles E. Gagnon, Brampton, both of Canada, assignors to Kinney Canada Inc., Weston, Canada

Filed Aug. 24, 1989, Ser. No. 398,537

Int. Cl.[5] A61L *9/04*

U.S. Cl. 239—59 **3 Claims**



1. An air treating device comprising first and second interacting bodies joining along a circular join line to provide a hollow container for a volatilizable air treating compound, said join line being in a unitary plane, a rotatable annular ring having at least two apertures for the passage of volatilized air, said annular ring being mounted about said hollow body for rotation in said unitary plane, means disposed interiorly of said annular ring to provide openings in said hollow body in register with said apertures at one position of rotation of the annular

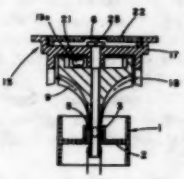
ring and for sealing said apertures at another position of rotation of the annular ring, a post for connecting said bodies together, said post including a male post section joined to the first interacting body and a female post section joined to the second interacting body, said male and female post sections cooperating when engaged to provide a post extending substantially axially with respect to the axis of rotation of said ring, said male and female post sections being connected sufficiently securely to prevent easy access to the hollow container, a donut shaped disc of volatilizable material having upper and lower surfaces mounted on said post substantially in said unitary plane whereby air will flow freely between at least two apertures over both said upper and lower surfaces of the disc.

4,944,456

ROTARY SPRINKLER

Avi Zakai, Rishon Le-Zion, Israel, assignor to Dan Mamtirim, Galil Elyon, Israel

Filed Apr. 27, 1989, Ser. No. 343,700
Claims priority, application Israel, Apr. 29, 1988, 86226
Int. Cl.[5] B05B *3/04*
U.S. Cl. 239—222.19 **5 Claims**



1. A rotary sprinkler comprising:
- a base member for coupling to an irrigation supply and formed with a plurality of base member outlets;
- a rotary distributor member of substantially cuspidal shape rotatably mounted with respect to said base member with an apical end thereof adjacent the base member and an opposite broad end thereof remote from the base member;
- a plurality of distributor passages formed in a curved surface of the distributor member, each passage extending from a passage inlet located in said apical end adjacent to a base member outlet to a passage outlet located in said broad end;
- a rotary turbine member rotatably mounted with respect to said distribution member and provided with a plurality of turbine blades disposed adjacent said passage outlets so that irrigation streams emerging from said passage outlets strike said blades and rotatably displace the turbine member;
- a water flow path extending through said sprinkler from said base member outlets to said passage outlets;
- a ball drive chamber defined by adjacent portions of said turbine and distributor members and outside said water flow path; and
- a ball drive means located in said ball drive chamber for transmitting the rotary displacement of the turbine member to the distributor member.

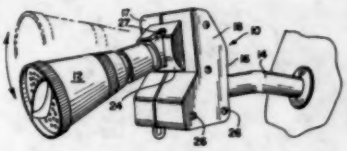
4,944,457

OSCILLATING DEVICE FOR FLUID NOZZLES

Mark Brewer, 25 W. 343 Highview, Naperville, Ill. 60540

Filed May 1, 1989, Ser. No. 345,460
Int. Cl.[5] B05B *3/16*
U.S. Cl. 239—242 **10 Claims**

1. A device adapted for direct attachment to a fluid pipe at one end and accommodating the attachment of a fluid nozzle at its opposed end for effecting the oscillating movement of a fluid nozzle in a vertical plane comprising in combination,
- a housing having a fluid inlet and a fluid outlet means mounted within a fluid outlet opening and spaced from said fluid inlet,
- said fluid inlet adapted to allow fluid under pressure to enter said housing,
- an impeller rotationally mounted within said housing and positioned in the path of fluid under pressure entering said housing through said fluid inlet thereby to rotate said impeller under the force of fluid under pressure,
- a gear system mounted within said housing and being operatively connected to said impeller,
- gear arm means operatively driven by said gear system at one end thereof and termination at an opposed end,
- said fluid outlet means comprising a fluid ejection nozzle mounted within the fluid outlet opening and adapted for oscillating movement in a vertical plane,



- said fluid ejection nozzle including connecting means for accommodating the engagement thereto of a shower head in linear alignment with said fluid ejection nozzle,
- and an actuator arm fixedly secured to said fluid ejection nozzle including mounting means associated therewith to accommodate the securement thereto of the opposed end of said gear arm means,
- whereby the rotational movement of said impeller caused by fluid under pressure causes a concomitant movement of said gear system which in turn causes a rotary movement of said gear arm means resulting in a reciprocating movement of said actuator arm and said fluid ejection nozzle in a vertical plane.

4,944,458

SPRAY CAN NOZZLE PROTECTOR

Richard Sassenberg, 180 E. Prospect Ave., Mamaroneck, N.Y. 10543

Filed Jan. 30, 1989, Ser. No. 302,922
Int. Cl.[5] B65P *1/04*
U.S. Cl. 239—288.5 **7 Claims**

1. A device for preventing the air drying of fluid at a fluid discharge orifice of a conventional spray nozzle assembly, said device comprising:
- a selectively removable and replaceable ring having a fibrous plug passing through the side wall of said ring, the diameter of said ring being only slightly larger than the diameter of the actuator of said spray nozzle assembly, said fibrous plug comprising an air blocking pad soaked in non-evaporative liquid which, when in use, is immediately

adjacent to and substantially in contact with said fluid discharge orifice.

4,944,459

MOUNTING/DISMOUNTING SYSTEM FOR MOUNTING AND DISMOUNTING A SPRAY GUN ON AND FROM A PAINTING ROBOT

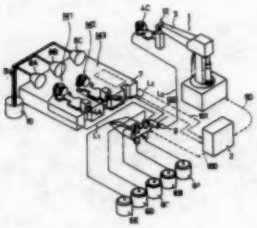
Takashi Watanabe, and Fujio Kobayashi, both of Yokohama, Japan, assignors to Tokico Ltd., Japan

Filed Dec. 15, 1988, Ser. No. 285,069

Claims priority, application Japan, Dec. 18, 1987, 62-192632[U]

Int. Cl.[5] B05B *13/00*; B67D *5/00*

U.S. Cl. 239—305 **11 Claims**



1. A mounting/dismounting system for mounting and dismounting a spray gun on and from an arm of a robot, comprising:

a base extending horizontally and having a flat top surface defined by a first side facing the robot and a second side opposing said first side for supporting said spray gun when the spray gun is dismounted, said flat top surface further being defined with a predetermined position on which the spray gun is to be positioned when the spray gun is waiting for mounting on the arm of the robot;

detecting means provided on the top surface of the base so as to be actuated by the spray gun when the spray gun is moved excessively towards said second side on the top surface and for producing an output signal indicating that the spray gun is displaced from said predetermined position towards said second side of the top surface;

a controller connected to said detecting means and to said robot for stopping the movement of the arm responsive to the output signal from said detecting means;

actuator means mounted on the base at a position below the base and connected to the controller so as to be actuated under control of the controller; and

an actuation arm driven by the actuator means, said actuation arm being movable between a first state in which a tip end of the atuation arm is located below the top surface of the base and a second state in which the tip end of the actuation arm is projected upwards beyond the top surface of the base at a horizontal position which is relatively close to the second side of the top surface as compared to that of the tip end of the arm in said first state, said tip end of the actuation arm urging said spray gun placed on the top surface to said predetermined position when the arm is moved from the first state to the second state.

4,944,460

MULTIFUNCTION NOZZLE

Robert W. Steingass, Valparaiso, Ind., assignor to Task Force Tips, Inc., Valparaiso, Ind.

Filed Sep. 9, 1988, Ser. No. 243,283

Int. Cl.[5] A62C *3/00*; B05B *1/26*

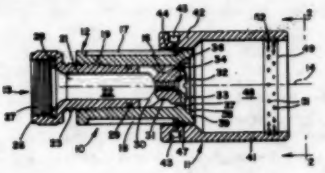
U.S. Cl. 239—428.5 **11 Claims**

1. A multifunction nozzle, comprising:

(a) a peripheral jet nozzle including barrel means and plunger means connected together for relative movement, said plunger means being adapted to receive a flow of liquid and said barrel means being movable relative to said plunger means to produce a substantially straight stream exit flow or a conically divergent exit flow of the liquid;

(b) a sleeve extending around said barrel and plunger means and being movable relative to said barrel means;

(c) said peripheral jet nozzle being operable to produce a conically divergent flow and said sleeve being movable into the exit flow of the liquid and the liquid being deflected forwardly by said sleeve, whereby the flow of said liquid causes air adjacent to it to be moved along with it, thereby creating a partial vacuum within said sleeve; and



(d) said partial vacuum within said sleeve inducing air from outside said sleeve to flow into said sleeve through said deflected flow of liquid;

(e) whereby a liquid containing a foaming agent creates a foam from said flows, and further including agitating means on said sleeve and located in the flow of the liquid.

4,944,461

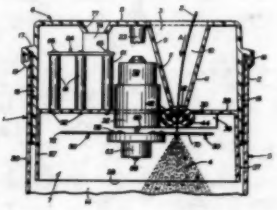
CARBON PAPER SHREDDER

Thomas L. Farnsworth, Hartville, Ohio, assignor to Invequest, Inc., North Canton, Ohio

Filed Aug. 7, 1989, Ser. No. 390,411

Int. Cl.[5] B02L *18/16*

U.S. Cl. 241—36 **15 Claims**



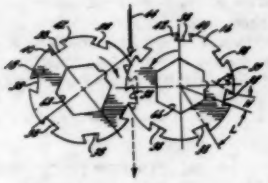
1. A carbon paper shredder including a housing having an upper cover and a lower receptacle, said receptacle having a top opening for receiving a piece of carbon paper, said cover being removably mounted on and covering the top opening of the receptacle and having a chute for feeding carbon paper into the interior of the housing; a cutting blade rotatably mounted within the housing; power driven feed rolls mounded adjacent the chute for drawing the piece of carbon paper through said chute and generally perpendicularly into the path of the cutting blade; an electric motor for rotating the cutting blade at a high speed to shred the piece of carbon paper into pieces which fall into the receptacle; and control means for controlling the rotation of the cutting blade including a single manually actuated control switch, for rotating the cutting blade in a forward cutting direction and for reversing the rotation of the cutting blade to eliminate jamming of said cutting blade.

4,944,462

SHREDDER

Donald E. Raterman, Deerfield, and John Muka, Harwood Heights, both of Ill., assignors to Cummins-Allison Corp., Mt. Prospect, Ill.

Filed May 2, 1989, Ser. No. 346,587
Int. Cl.[5] B02C 4/08, 18/16
U.S. Cl. 241—100 22 Claims



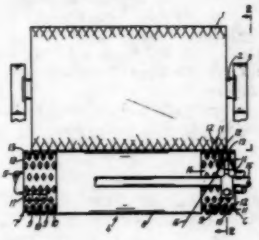
1. A device for shredding sheet material, comprising:
first and second parallel shafts mounted for rotation in opposite directions;
a first plurality of discs fixed on said first shaft for rotation therewith and spaced at intervals along the length of said first shaft;
a second plurality of discs fixed on said second shaft for rotation therewith and spaced at intervals along the length of said second shaft to interleave with said first plurality of discs, wherein the periphery of each of said first and second plurality of discs has a V-shaped cross-section to form dual shredding blades at the axial edges of each disc;
at least one notch formed in the periphery of each disc, each of said notches narrowing toward the periphery of said each disc to form opposed double-pointed portions.

4,944,463

APPARATUS FOR CROSS-WINDING A TRAVELING YARN

Hans Raasch, Moenchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed May 3, 1989, Ser. No. 346,874
Int. Cl.[5] B65H 54/46
U.S. Cl. 242—18 DD 5 Claims



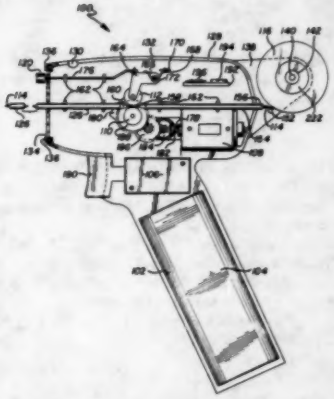
1. Apparatus for cross-winding a traveling yarn on a bobbin comprising a driven winding drum for peripheral contact with said bobbin for driving rotation thereof, and yarn guide means for traversing movement along said bobbin for applying the yarn in a cross-wound fashion to the periphery of said bobbin, said winding drum having two peripheral areas spaced from one another along said winding drum for contact respectively with opposite end areas of said bobbin whereat reversal of the cross-winding of the yarn occurs and a generally smooth peripheral area along said winding drum between said spaced peripheral areas, each said spaced peripheral area defining for any given said bobbin a plurality of discrete yarn engagement members spaced with respect to one another over the circumferential and axial extents of said spaced peripheral area, each said yarn engagement member being adapted for guiding the yarn onto said bobbin at its opposite end areas to resist axially inward deviation of the yarn from its cross-winding angle at the location of yarn cross-winding reversal.

4,944,464

SOLDER DISPENSING APPARATUS AND METHOD OF OPERATION

Jerry L. Zelenka, 4410 N. Henley Ct., Westlake Village, Calif. 91361

Filed Oct. 24, 1988, Ser. No. 261,622
Int. Cl.[5] B65H 75/00
U.S. Cl. 242—54 R 20 Claims



1. A solder dispensing apparatus comprising, in combination:
housing means having a body and a handle;
driving means disposed within said body, said driving means operating a pulling means for moving a line of solder through a passageway located within said housing means;
energizing means mounted within said handle for electrifying said driving means;
controlling means disposed within said housing means for connecting said driving means to said energizing means and for limiting the speed of said driving means;
regulating means in electrical communication with said driving means for maintaining a constant input voltage to said driving means;
reducing means disposed between said driving means and said pulling means for providing improved speed change sensitivity; and
extending means in mechanical communication with said passageway for providing improved maneuverability and dispensibility of said line of solder to a designated solder joint.

4,944,465

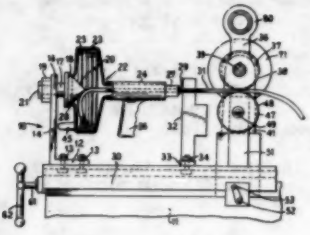
SPRING DRIVING AND WINDING MACHINE

Aaron J. Levine, 3180 N. Lake Shore Dr., Apt. 5A, Chicago, Ill. 60657

Filed May 11, 1989, Ser. No. 350,409
Int. Cl.[5] B65H 75/36
U.S. Cl. 242—54 R 4 Claims

1. A spring snake driving and winding machine for a plumbing cleanout tool including a snake magazine formed with an opening comprising, a base, a first upright member supported from said base, a conical member rotatably supported by said first upright member, a pair of rollers formed with concave edges rotatably supported by said base above each other and moveable relative to each other so as to clamp said spring

snake therebetween, a drive means connected to at least one of said pair of rollers, and said plumbing cleanout tool mountable on said machine with said conical member extending partially



within said opening of said magazine of said plumbing cleanout tool so that said spring snake can be loaded into said magazine as said driving means is energized.

4,944,466

FLEXIBLE SHEET MATERIAL DISPENSER WITH AUTOMATIC ROLL TRANSFERRING MECHANISM

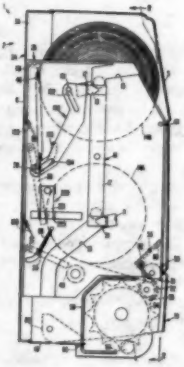
Paul W. Jespersen, Houston, Tex., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 218,994, Jul. 14, 1988, Pat. No. 4,856,724. This application May 17, 1989, Ser. No. 352,110

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] B65H *19/00*

U.S. Cl. 242—55.3 **31 Claims**



1. A dispenser for rolls of flexible sheet material wound on cores, the cores having ends extending beyond the sides of the rolls, the dispenser comprising:

a housing having opposite sidewalls, each sidewall having a guide track comprising a substantially vertical channel formed between lateral walls for receiving and guiding the core ends;

a substantially vertically disposed holding lever pivotably attached to each sidewall, said holding levers including an upper projection adjacent an upper end of said guide track for retaining a reserve roll of flexible sheet material at an upper reserve position along said guide track and a lower projection adjacent a lower end of said guide track for retaining a dispensing roll of flexible material at a lower position along said guide track;

a transfer roller supported in said housing adjacent the lower end of said guide track for contacting a roll of sheet material during a portion of the dispensing of the sheet material from the dispenser; and

dispensing means including at least one roller supported in said housing adjacent the dispensing roll and laterally of said transfer roller for dispensing sheet material from the dispensing roll and out of said dispenser;

said transfer roller and said lower projections of said holding levers being located in said housing a predetermined distance from one another so that said transfer roller contacts the roll surface of a dispensing roll until a predetermined amount of sheet material is dispensed from the dispensing roll, said lower end of said guide tracks being positioned with respect to said dispensing means to locate the dispensing roll out of contact with rollers of said dispensing means.

4,944,467

METHOD AND APPARATUS FOR DECELERATING A JUMBO ROLL OF A PAPER OR BOARD MACHINE

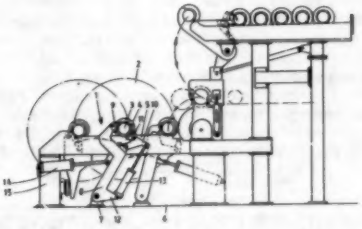
Keijo K. Snygg, Karhula, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed Feb. 27, 1987, Ser. No. 19,617

Claims priority, application Finland, Feb. 27, 1986, 860835

Int. Cl.[5] B65H *18/16, 19/30*

U.S. Cl. 242—65 **15 Claims**



1. A method of decelerating and transferring a rotating jumbo roll associated with a paper or board manufacturing machine after a web has been completely wound about a reel drum to form said jumbo roll, comprising the steps of:

(a) providing a pair of pivotally mounted and substantially opposed brake shoes and causing said shoes to swing into engagement with brake surface means provided on said drum to decelerate rotation of the drum;

(b) actuating transfer means while said reel drum is rotating to move said jumbo roll in a direction perpendicular to its axis of rotation; and

(c) continuing to apply said brake shoes to said brake surface means during said transfer means actuating step.

4,944,468

EXPANDABLE ROLL SPINDLES WITH INTEGRAL DIRECTIONAL CONTROL VALVE

Lawrence R. Damour, 16 Chesler Square, Succasunna, N.J. 07876

Filed May 10, 1989, Ser. No. 351,390

Int. Cl.[5] B65H *75/24*

U.S. Cl. 242—72 B **9 Claims**

1. An improved rotatable and expandable spindle assembly comprising:

(a) an elongated hollow shaft having an inner diameter and an outer diameter;

(b) a first end portion of said hollow shaft;

(c) a second end portion of said hollow shaft, said second end distal said first end;

(d) said hollow shaft adapted for cantilever mounting by said first end;

(e) an elongated expanding sleeve member, said sleeve mem-

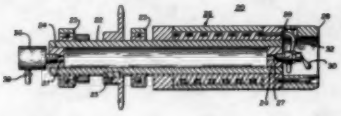
ber retentively engaged on the outer diameter of the second end of the shaft, said sleeve member adapted to loosely receive a roll of material thereon;

(f) a three way directional control valve having at least one inlet port, at least one outlet port, and at least one exhaust port;

(g) an actuating means for operating said valve;

(h) a first elongated conduit connected to said inlet port of the valve, said first conduit for carrying a constant supply of a pressurized medium into said inlet port, said first conduit including means for allowing the selective continuous rotation of the spindle;

(i) a means for mounting said valve to the spindle assembly



at or near the second end of the shaft, said mounting means allowing for the passage of the constant supply of the pressurized medium interior of said hollow shaft;

(j) a second elongated conduit means for connecting said outlet port of the valve with the expanding sleeve member; and

(k) said actuator means adapted for selectively operating said valve for directionally controlling the flow of the pressurized medium either to or away from the expandable sleeve member, for a rapid expansion or exhausting of said sleeve member, said expansion of said sleeve member to retentively engage an interior diameter of the roll of material placed thereon with a constant supply of the pressurized medium.

4,944,469

HIGH SPEED COILING APPARATUS

Thomas N. Wilson, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Dec. 28, 1988, Ser. No. 290,949

Int. Cl.[5] B21C *47/14*

U.S. Cl. 242—82 **37 Claims**

13. A rotatable flyer tube for use in coiling a continuous rod product advancing along a path of travel having an axis comprising an elongated tube with a rod entry end and a rod discharge end, said tube having a circular cross-section and a curvature about said axis, the radius of curvature of said tube continuously increasing from the entry end to the discharge end thereof, the discharge end being oriented and rotatably driven such that the rod product exits said tube with a radially outward component of motion.

4,944,470

LAMINATOR UNWIND ROLL STAND

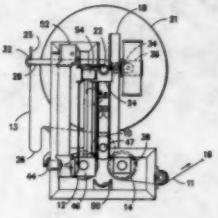
George A. Mobley, Roebuck, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 229,253, Aug. 8, 1988, Pat. No. 4,832,272.

This application Feb. 13, 1989, Ser. No. 308,919

Int. Cl.[5] B65H *19/16, 19/22, 19/00*

U.S. Cl. 242—58.4 **1 Claim**



1. A method to continuously unwind a web of material by splicing replacement rolls of material thereto without stopping the unwinding operation comprising the steps of: unwinding a roll of material, placing a replacement roll of material above the roll of web material being unwound, placing a strip of double-side adhesive tape to the surface of the tail of the replacement roll of web material on the side of the tail which faces the roll of web material, applying a suction pressure to the tail of the replacement roll of web material and moving the tail to a position adjacent the roll of web material being unwound, maintaining the suction pressure on the tail until the roll of web material being unwound is almost exhausted, transferring the tail of the replacement web material to a perforated roll by releasing the suction pressure thereon and exerting another suction pressure thereon through the perforated roll and rotating the perforated roll to move the tape into engagement with the web of material of the roll being unwound to splice the replacement roll of web material thereto to allow the unwinding operation to continue uninterrupted.

4,944,471

METHOD OF PRODUCING A YARN TENSION ON A BOBBIN CREEL

Manfred Bollen, Oberuzwil, Switzerland, assignor to Benninger AG, Uzwil, Switzerland

Filed Dec. 12, 1988, Ser. No. 282,555

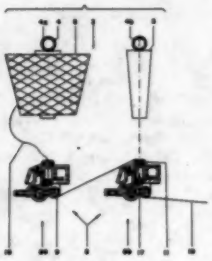
Claims priority, application Switzerland, Dec. 23, 1987, 5049/87

Int. Cl.[5] B65H *49/02, 59/22*

U.S. Cl. 242—131.1 **1 Claim**

1. A method of producing a yarn tension on a bobbin creel which is associated with a winder and has a plurality of bobbin holding means arranged in rows for accommodating bobbins and associated with a respective yarn tensioner for each bobbin holding means, the method comprising drawing off a yarn from a bobbin mounted on one of said bobbin holding means in a row thereof, firstly passing said yarn through a first yarn tensioner associated with said bobbin, omitting a bobbin from further yarn holding means which is adjacent in said row,

returning said yarn after leaving said first yarn tensioner to a second yarn tensioner associated with said further yarn hold-



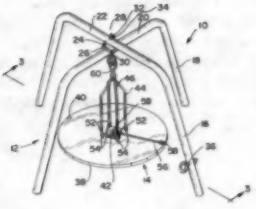
ing means and passing said yarn through said second yarn tensioner before said yarn is fed to the winder.

4,944,472

APPARATUS FOR DISPENSING COILED ELECTRICAL WIRE OR CABLE

Ira R. Stahl, 3913 Lankenau Avenue, Philadelphia, Pa. 19131, assignor to Ira R. Stahl and John Siemiarowski, both of Philadelphia, Pa.

Filed Sep. 21, 1988, Ser. No. 247,212
Int. Cl.[5] B65H *49/00, 16/00*
U.S. Cl. 242—129 **9 Claims**



1. An apparatus for dispensing spooled cable comprising:

a collapsible stand including two inverted generally U-shaped legs, each leg having an apex, said legs being pivotably connected at said apexes, said legs being movable between a collapsed position in which said legs are aligned one over the other and an in use position in which said legs are crossed;

a collapsible reel including a flat base, a pair of inverted generally V-shaped rods pivotably mounted to said base, said rods being movable between an in use position in which said rods stand upright on said base and a collapsed position in which said rods lie next to said base;

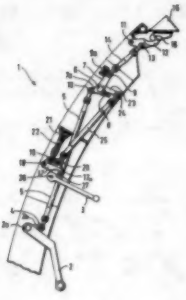
means for hooking said reel to said stand so that when said stand and said reel are in their respective in use positions, said reel rotates freely within said legs and when said stand and said reel are in their respective collapsed positions, the apparatus is flat.

4,944,473

LOCKING MECHANISM FOR AN AIRCRAFT DOOR

Guenter Kallies, and Wolfgang Lessat-Kaupat, both of Hamburg, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 317,945
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807067
Int. Cl.[5] B64C *1/14*
U.S. Cl. 244—129.5 **5 Claims**



1. A locking mechanism for an aircraft door, comprising means for latching said aircraft door in its closed condition, said latching means comprising an operating lever, latching eye means, latching hook means for engaging said latching eye means, linkage means including toggle action means operatively connecting said operating lever to said latching hook means for operating said latching hook means, testing means for ascertaining and indicating an improperly latched condition and a properly latched condition, said testing means comprising a testing lever (3) including arresting means for arresting said testing lever against further manipulation, and means for interlocking said latching means and said testing means, said interlocking means comprising a blocking member for cooperation with said arresting means of said testing means, and means for operating said blocking member in response to said improperly latched condition of said latching means to thereby render said testing lever inoperable for indicating said improperly latched condition, said testing lever remaining operable in response to said properly latched condition to indicate said properly latched condition.

4,944,474

SPEED INDICATION SYSTEM

Laurence W. Jones, Newcastle, Australia, assignor to Kooragang Coal Management Pty. Ltd., Newcastle, Australia

Continuation of Ser. No. 230,554, Aug. 10, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 442,460
Claims priority, application Australia, Aug. 11, 1987, PI3661
Int. Cl.[5] B61L *3/18, 15/00*
U.S. Cl. 246—122 R **8 Claims**

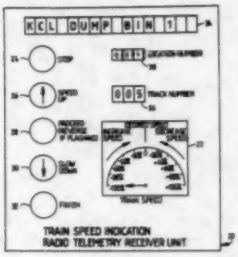
1. A speed indication system for use in railway locomotive in providing locomotive speed related information to a locomotive driver, comprising:

a sensing means located within a railway track for sensing a locomotive at predetermined locations on said railway track, said sensing means generating locomotive position information signals; a speed related information calculating means operably coupled to said sensing means and located outside of said railway track for calculating locomotive speed related information based on said locomotive position information signals;

transmitter means operably connected to said speed related information calculating means for transmitting at least one

of locomotive position signals and locomotive speed related information to said locomotive;

a receiver means located within said locomotive for receiving at least one of said locomotive position signals and locomotive speed related information from said transmitter means; and



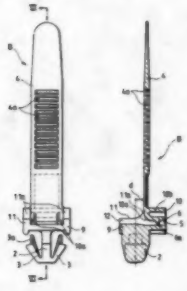
a display means in said locomotive operably connected to said receiver means for displaying information indicative of said locomotive speed related information, wherein said display means has means for indicating a specific amount of required change in the speed of the locomotive-so that the driver can increase or decrease the speed of the locomotive in accordance to the amount of the required change in the speed of the locomotive.

4,944,475

ELECTRIC WIRE BUNDLER

Mamoru Ono; Ichiro Kudo, and Toshio Okazaki, all of Aichi, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 240,335, Sep. 16, 1988, abandoned. This application Sep. 20, 1989, Ser. No. 410,040
Claims priority, application Japan, Sep. 4, 1987, 62-134664
Int. Cl.[5] F16L *3/03*
U.S. Cl. 248—71 **5 Claims**



1. An electric wire bundler for fixing at least one electric wire to a base support, comprising:

an electric wire rest on which said electric wire is to be supported;

an anchor for engaging with a portion of said base support, said anchor being disposed on a side of said wire rest and extending substantially perpendicularly therefrom, said anchor having a longitudinal axis extending therealong which is substantially aligned with said electric wire rest;

a boss provided on another side of said electric wire rest, said boss having an insertion hole disposed perpendicular to said longitudinal axis of said anchor, an engaging arm with a projection thereon provided in said insertion hole and a first end wall facing said longitudinal axis of said anchor, said first end wall being displaced from said longitudinal axis of said anchor by a predetermined distance, and wherein said engaging arm extends downwardly from said first end wall and curves around into said insertion hole; and

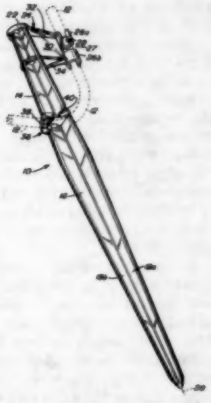
a flexible band extending from a top surface of said boss along said first end wall thereof parallel to said longitudinal axis of said anchor and having a plurality of engaging portions at intervals in a longitudinal direction thereof, said flexible band being insertable into said insertion hole of said boss such that one of said engaging portions engages said projection on said engaging arm of said boss so as to secure said at least one electric wire to said bundler, wherein the center of said at least one electric wire is substantially aligned with said longitudinal axis of said anchor.

4,944,476

GROUND STAKE FOR RETAINING IRRIGATION CONDUIT

Donald O. Olson, 1935 Atlozana Dr., El Cajon, Calif. 92020

Filed Dec. 16, 1988, Ser. No. 285,550
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—87 **10 Claims**



1. A stabilizing stake adapted to be placed in a preselected ground area for retaining a flexible irrigation conduit, said stake comprising:

an elongated body having an upper portion and an integral lower portion with a longitudinal centerline extending through said portions;

a first integral conduit gripping means attached to and supported by said upper body portion for holding an end portion of said conduit in a generally upright position and for preventing it from rotating; and

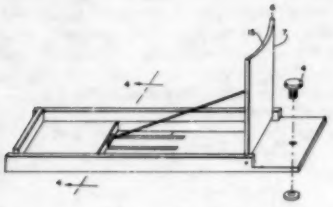
a second integral conduit gripping means on said body extending generally transverse to its said centerline and located below said first gripping means, said second gripping means including an open channel with spaced apart opposite edges for further holding the conduit retained by said first gripping means so that the conduit will remain in a position substantially parallel to said ground area.

4,944,477

FOLDING TILTED BOTTLE HOLDER

Stephen R. Hendren, 13201 NW. 1st Ct., North Miami, Fla. 33168

Filed Aug. 21, 1989, Ser. No. 396,371
Int. Cl.[5] A47F 7/00
U.S. Cl. 248—150 5 Claims



1. A folding bottle holder having two conditions, a first, flat condition for access and a second, upright condition for holding a bottle in a tilted orientation on a shelf with the neck of the bottle above the bottom of the bottle, said holder comprising:

(a) a sliding carriage means having bottom engaging means for engaging said bottom of said bottle;

(b) an elongate base member having a bottom surface, a top surface, two long opposed sides and two short opposed ends, a front end and a rear end, said bottom surface adapted for resting upon said shelf, said base member including carriage-engaging means for holding said carriage means on said top surface in slideable engagement for sliding between a first carriage position away from said rear end when said holder is in said first, flat condition and a second carriage position approximating said rear end when said holder is in said second, upright condition;

(c) a pivoting support member hving bottle support means for engaging the upper portion of said bottle and holding it above said bottom of said bottle in stable position when said holder is in said second, upright condition;

(d) pivot means pivotally connecting said support member to said base member, wherein said support member may be rotated between a substantially horizontal position when said holder is in said first, flat condition and a substantially vertical position when said holder is in said second, upright condition; and

(e) connecting means operatively connecting said carriage means and said support member, said connecting means causing said support member to rotate to the vertical position as said carriage means slides from said first carriage position to said second carriage position upon action of the bottom of said bottle upon said bottom engaging means, and said connecting means further causing said carriage means to slide from said second carriage position to said first carriage position as said support member is rotated to the horizontal position by action of said uper portion of said bottle upon said support member during removal of said bottle.

4,944,478

PORTABLE GRAB BAR

John L. Sullivan, 38 Brightwaters Dr., Sound Beach, N.Y. 11789

Filed Oct. 18, 1989, Ser. No. 423,953
Int. Cl.[5] A47B 96/06
U.S. Cl. 248—205.7 4 Claims

1. A portable grab bar for use by a person requiring the aid of such a device for support, said grab bar comprising, in combination: bar means; a first suction means secured to one end of said bar means having a suction member and an integral manually operated spring biased vacuum pump for evacuating air from under said suction member when adhering said first suction means to a surface; a second suction means secured to the other end of said bar means having a suction member and an integral manually operated spring biased vacuum pump for evacuating air from under said suction member when adhering said second suction means to a surface; the arrangement being such that said bar means is supported parallel to and spaced from a surface to which said suction members are adhered; and

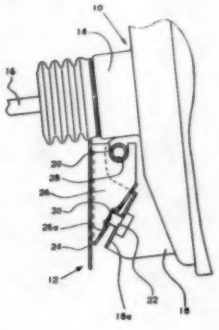
indicator means provided on each of the aforesaid vacuum pumps by which a user of the grab bar is warned when the pressure adhering a suction means to a surface may not be sufficient to support an additional force applied to the grab bar by a person using the grab bar.

4,944,479

SYSTEM FOR MOUNTING A BOOSTER

Jean-Pierre Gautier, Aulnay Sous Bois, France, assignor to Bendix France, Drancy, France

Filed May 25, 1989, Ser. No. 357,448
Claims priority, application France, Jun. 27, 1988, 88 08585
Int. Cl.[5] F04G 5/06
U.S. Cl. 248—222.2 7 Claims



1. A system for mounting a booster on a supporting bracket, comprising:

catching members by means of which the booster rests on the supporting bracket as a result of gravity, said catching members defining a pivoting axis orthogonal to an actuating rod of the booster,

bearing faces arranged on the same side of the booster as the catching members and capable of being laid against one another under the effect of pivoting of the booster about said axis when a pushing force is exerted on the actuating rod, and

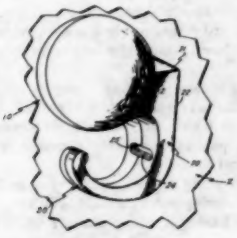
fastening members which keep the bearing faces against one another, the fastening members extending irreversibly one into another.

4,944,480

WALL MOUNTED CLOTHES HANGER

William E. Jarrett, 1465 Calvin, S.E., Grand Rapids, Mich. 49507, assignor to William E. Jarrett, Grand Rapids and Dan H. Vollink, Lowell, both of, Mich.

Filed Aug. 8, 1983, Ser. No. 521,439
The portion of the term of this patent subsequent to Mar. 11, 2000, has been disclaimed.
Int. Cl.[5] A47F 5/00
U.S. Cl. 248—309.1 **1 Claim**



1. A clothes hanger for mounting on a wall, comprising:

a body comprising an upper, curved, convex surface wherein each point on said surface along any vertical section through the center of volume enclosed by said surface has a radius of curvatures of at least about one inch but no more than two inches, and wherein the sides extend downwardly to beyond their horizontal radii; and

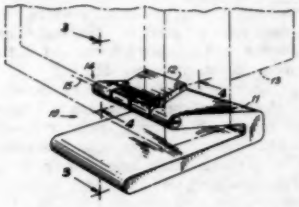
a secondary clothes hook initially extending generally downwardly from said body and then extending upwardly to form a hook, wherein the end of said hook remains under said body and terminates at a point less distant from the wall than the outermost point of said body when said hanger is mounted on a wall, and the distance between said end and the lowermost portion of said body is such that a human head cannot come in direct contact with said end, said body shielding said end from such contact.

4,944,481

BALANCED MONITOR STAND

James R. Yurchenco, Palo Alto, and Eugene F. Duval, Menlo Park, both of Calif., assignors to NeXT, Inc., Redwood City, Calif.

Filed Jun. 30, 1988, Ser. No. 213,356
Int. Cl.[5] A47G 1/24
U.S. Cl. 248—372.1 **24 Claims**



1. A stand for supporting an object above a surface, said object having a mass and a center of gravity, such that said can be rotated about a horizontal axis between two extreme angular positions, said center of gravity being at a distance from said axis, said stand comprising:

base means for resting on said surface;

platform means for holding said object; and

hinge means linking said base means and said platform means, said hinge means comprising:

a hollow axle aligned with said axis and having first and seconds ends, said axle having first and second tube sections, each of said sections having an end remote from its respective axle end and an extension at said remote end extending less than 180 degrees about said axis, said first and second axle sections abutting with said extensions in overlapping relationship, said extensions forming stop means defining said extreme positions,

first and second means on said base for receiving said first and second ends, respectively, of said axle,

means on said platform for rigidly engaging one of said first and second tube sections, and

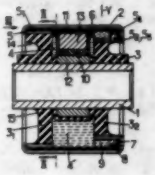
spring means capable of torsional deflection disposed within said axle, one end of said spring means being rotationally fixed relative to another of said first and second tube sections and another end of said spring means being rotationally fixed relative to said one of said first and second tube sections, such that relative rotational movement of said base means and said platform means creates a restoring a torque in said spring means, said spring means having a torque constant selected with regard for said mass and said distance so that said restoring torque substantially balances gravitational torque acting on said center of gravity when said platform means holding said object is rotated to different angular positions between said extreme positions.

4,944,482

HYDRAULIC VIBRATION DAMPING BUSHINGS

Bernard Boubier, Vierzon, France, and Bernd-Siegfried Butow, Stuttgart, Fed. Rep. of Germany, assignors to Hutchinson, France

Filed Sep. 13, 1989, Ser. No. 406,336
Claims priority, application France, Sep. 13, 1988, 88 11919
Int. Cl.[5] F16F 5/00
U.S. Cl. 248—562 **5 Claims**



1. A hydraulic vibration damping bushing comprising an external and internal tubular rigid armatures (1, 2), said external armature surrounding said internal armature and jointly united by an elastomeric body (3) configured in such a way to form with said armatures at least two tight pockets (4,4') diametrically opposed and communicating with each other by a narrow channel (7), said pockets and said channel being filled with a damping liquid, and an orifice (9), of the narrow channel (7), which opens into one of a two pockets (4) being located outside a central area of a portion of the said tubular rigid armatures, which define said one pocket, characterized in that it includes an elastomeric pad (10) housed inside said one pocket and secured on a concave face of a rigid plate (11), curved in the manner of a portion of cylinder of revolution having an angular extent at most equal to 180 degrees, the shapes and sizes of the pad and of the plate being selected in such a way that the plate permanently abuts on an internal face of the external tubular armature (2) and that, in a resting position of the bushing, the pad (10) is diametrically precompressed between the two armatures (1, 2) and pressed against the aforesaid central area of the internal tubular armature (1).

4,944,483

APPARATUS FOR FORMING FIBER REINFORCED SLAB GEL FOR USE IN ELECTROPHORESIS

Hideyuki Nishizawa, 1-5-1 Nakazto Kuta Ku, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 288,527

Claims priority, application Japan, Dec. 22, 1987, 62-324962

Int. Cl.[5] B29C *33/10*; G01N *27/26*

U.S. Cl. 249—83 **8 Claims**

1. Apparatus for forming gel slabs for use in electrophoresis comprising:

a box shaped casing, having an open vertical side and a first horizontal groove centrally located in an inner lower end surface thereof;

a cover hermetically closing said open vertical side of said casing;

said cover having an upwardly extending second groove located on a surface thereof facing said casing with a lower end aligned with said first groove;

a pouring pipe in the lower end of said second groove and above said first groove for pouring an aqueous solution of organic monomer material into said casing, which when polymerized forms said gel slabs;

an air vent in the upper end of said second groove;

a plurality of spaced apart slab forming plates vertically stacked in said casing, one of said plates abutting the inner surface of said cover and extending to the upper end of said second groove.

4,944,484

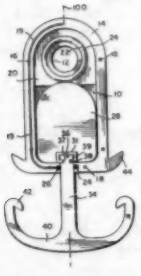
GATE VALVE WITH LOCKING HANDLES

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.

Continuation of Ser. No. 831,068, Feb. 20, 1986, abandoned, which is a continuation of Ser. No. 694,697, Jan. 25, 1985, abandoned. This application Jun. 26, 1989, Ser. No. 372,231

Int. Cl.[5] F16K *35/00*

U.S. Cl. 251—101 **6 Claims**



1. A gate for use with poultry watering systems comprising:

a valve body having a fluid passageway therethrough;

said valve body having a pair of opposed side walls of a predetermined width and an intersecting pair of opposed face walls of a predetermined width substantially greater than the width of said side walls;

a valve member slideably disposed within said valve body between open and closed positions for controlling fluid flow through said passageway;

a valve stem means rotatably attached to said valve member and extending outside said valve body at one end thereof to form a handle portion;

said handle portion being disposed for one directional linear manipulation to move said valve member between said open and closed positions;

locking means for simultaneously locking said valve member in said closed position when said valve member is moved into said closed position by said linear motion of said valve stem;

said locking means including a pair of oppositely disposed catches formed on said side walls at said end of said valve body from which said valve stem extends and a corresponding pair of oppositely disposed latches formed as part of said handle portion;

said latches being spaced apart by a predetermined first distance corresponding to said width of said face walls;

said latches having a side width of a second predetermined distance;

said second predetermined distance being substantially less than said first predetermined distance so as as to facilitate visual aligning of said latches with said side walls and said catches prior to movement of said valve member into said closed position; and

said latches being formed to snap-lock onto said catches with the provision of a distinct, audible snap when said valve member is moved into said closed position.

4,944,485

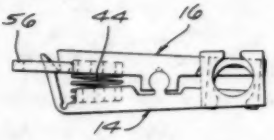
CLAMP FOR FLEXIBLE TUBING

Adib G. Daoud, and Fred W. Bacher, both of San Diego, Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Aug. 28, 1989, Ser. No. 398,887

Int. Cl.[5] F16K *7/02*

U.S. Cl. 251—9 **7 Claims**



1. A clamp for flexible tubing for use in a means for delivering fluid having a housing and a door mounted on said housing to be adjacent said housing in a closed position, said means for delivering fluid being adapted to retain said tubing and said clamp in a space between said housing and said door in the closed position, said clamp comprising:

means for receiving said flexible tubing, including first and second elongated clamping members each having first and second ends, each clamping member having gripping means adjacent one of said ends for restricting fluid flow in said tubing when said tubing is clamped therebetween, one of said clamping members having a pivot hinge member intermediate said one clamping member first and second ends, and the other clamping member having a corresponding socket for receiving said pivot hinge member intermediate said other clamping member first and second ends;

means for biasing said gripping means together to clamp said flexible tubing received therebetween; and

latch means for releasably latching said gripping means apart in an engaged position, said clamping members being otherwise free to move to a disengaged position clamping

said flexible tubing responsive to said means for biasing when said clamping members are not latched apart, and said latching means being forced to an intermediate disengaged position when said clamp is received in said space between said housing and said door, and said door is in the closed position, whereby said tubing received in said means for receiving fluid and said clamp is unclamped when said door is in the closed position, and said tubing becomes clamped when said door is moved to an open position.

4,944,486

ELECTROMAGNETICALLY ACTUATABLE VALVE AND METHOD FOR ITS MANUFACTURE

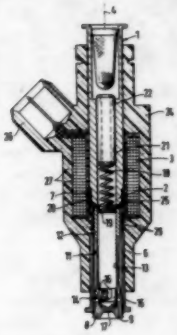
Rudolf Babitzka, Birkenweg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,782

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825134

Int. Cl.[5] F16K *31/06*

U.S. Cl. 251—129.21 **12 Claims**



1. An electromagnetically actuatable fuel injection valve for fuel injection systems in internal combustion engines, comprising a ferromagnetic, metal connection fitting serving as a core extending along a longitudinal axis of the valve, a magnet coil being disposed on the connection fitting, an armature being disposed adjacent said magnet coil and provided with a valve closing body (14), a metal valve seat body (8) including a fixed valve seat (9), said magnetic coil being adapted to actuate said armature and thereby said valve closing body with respect to said fixed valve seat (9), a plastic sheath surrounding at least a portion of the connection fitting and all of the magnet coil (3), and said plastic sheath includes fillers (27) having ferromagnetic properties adapted to conduct magnetic field lines provided within at least that portion of the plastic sheath (24) surrounding the magnetic coil (27).

4,944,487

DIAPHRAGM VALVE

Ludwig K. Holtermann, Old Saybrook, Conn., assignor to Lee Company, Westbrook, Conn.

Filed May 8, 1989, Ser. No. 349,392

Int. Cl.[5] F16K *31/06, 7/14*

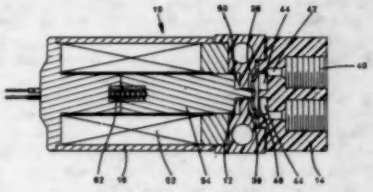
U.S. Cl. 251—129.17 **21 Claims**

1. A diaphragm valve comprising:

A. valve body means defining a first flow passage, a second flow passage and a valve seat means between the first and second flow passages;

B. diaphragm means comprised of an elastomeric material sealingly engageable with the valve seat means to prevent passage of fluid between the first and second flow passages;

C. retractable means for releasably biasing the diaphragm means against the valve seat means to sealingly engage therewith and control the flow of fluid through the valve; and



D. means for subjecting the diaphragm means to radial compression sufficient to cause the diaphragm means to disengage from the valve seat means when the biasing means is retracted.

4,944,488

GATE VALVE

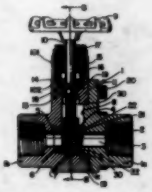
Peter D. Clayson, Edmonton, Canada, assignor to Alberta Ltd., Canada

Division of Ser. No. 231,131, Aug. 11, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 436,120

Claims priority, application Canada, Nov. 26, 1987, 552900

Int. Cl.[5] F16K *3/12*

U.S. Cl. 251—203 **9 Claims**



1. A gate valve of the type suitable for use in high pressure steam systems and the like, comprising:

(a) a valve body having a main body portion containing a valve chamber completely open on one side wall of the valve body such that the whole of the valve chamber is exposed and accessible for maching thereof, and a neck portion containing a closed stem chamber completely surrounded by an integral, unbroken chamber wall, said open side wall being machined to provide a flat mating surface surrounding said open valve chamber;

(b) said main body portion having inlet and outlet ports for high-pressure fluid and a transverse passage extending therebetween;

(c) a valve gate member guided vertically in said valve chamber and movable between an open position, in which said gate member is above said transverse passage, and a closed position, in which said gate member obstructs said passage to prevent fluid flow therethrough;

(d) said valve gate member having a smooth flat-faced downstream wall, which in the closed position seats on a flat-faced seat surrounding said passage, and having a wedge-shaped upstream wall, which cooperates with a wedge-shaped wall in said chamber to force the downstream wall sealingly onto the flat-faced seat;

(e) a valve stem guided in said neck portion through said

stem chamber and surrounded by said integral wall thereof, said valve stem extending into said valve chamber, said valve stem having a threaded lower end cooperating with a threaded recess in said gate member, and said stem being rotatable in a bearing means in said neck portion to raise and lowe said gate member between said open and closed positions;

(f) said open side of said main body portion being closed by a removable closure plate having a flat surface mating with the corresponding flat surface on said main body portion;

(g) clamping means for clamping said closure plate firmly to said main body portion;

(h) said closure plate further having a smooth protuberance on an inner surface thereof, which is slidable into the open side of the valve chamber so as to partially penetrate said valve chamber and become snugly located therein;

(i) said mating flat surfaces of said closure plate and said main body portion enclosing a recess surrounding the valve chamber for accommodating sealing means; and

(j) sealing means trapped in said (a) recess surrounding the valve chamber under the action of said clamping means to prevent leakage of high pressure fluid from said valve chamber;

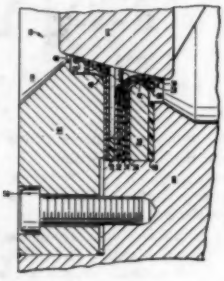
whereby said closure member can be removed to expose the whole of the interior of said valve chamber to permit machining thereof, and clamped in position on said main body portion to permit operation in high pressure steam systems and the like without compromising valve integrity.

4,944,489

ROTARY VALVE AND SEAL

Horst H. Adams; Bernd Brüggestrath, both of Bochum, and Rudolf A. Kappe, Marl, all of Fed. Rep. of Germany, assignors to Gebruder Adams Armaturen U. Apparate GmbH & Co., K.G., Fed. Rep. of Germany

Filed Aug. 10, 1989, Ser. No. 392,247
Int. Cl.[5] F16K *1/22*
U.S. Cl. 251—306 **18 Claims**



1. A rotary valve assembly including a housing, a valve member and a seal assembly, the seal assembly comprising:

a first resilient seal subassembly having a resilient sealing element, the sealing element having a substantially linear section and a curved section formed integrally with the linear section;

means for changing the resiliency of the first resilient seal subassembly, the means for changing comprising a second resilient sealing element having a substantially linear section and a curved section formed integrally with linear section, the linear and curved sections of the second resilient sealing element being disposed adjacent linear and curved sections of the first resilient sealing element, the second resilient sealing element having different resiliency characteristics then the first resilient sealing element, and

the first seal subassembly further comprising an annular gasket disposed between the first resilient sealing element and the second resilient sealing element; and

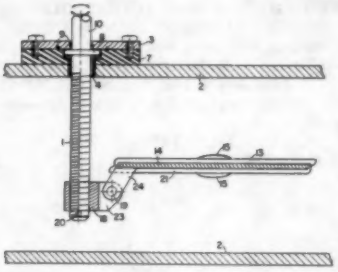
means for mounting the seal subassembly in the valve assembly.

4,944,490

SHAFTLESS BUTTERFLY VALVE

Paul G. Kennedy, 4174 Ridge Rd., Horseheads, N.Y. 14845

Filed Nov. 7, 1988, Ser. No. 268,298
Int. Cl.[5] F16K *5/06*
U.S. Cl. 251—306 **6 Claims**



5. A butterfly valve in a round pipe-like conduit, comprising:

a. a round pipe-like conduit;

an elliptical plate means;

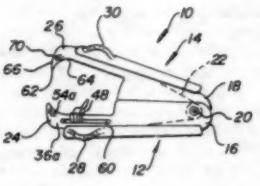
stem means reversibly rotating said plate means on an axis perpendicular to said pipe and also perpendicular to said stem means and at the same time translating the plate in the same direction as the flow in the round pipe to be sealed.

4,944,491

EXPANDING STAPLE REMOVER

Norbert Kirk, 1458 W. Belle Plaine, Chicago, Ill. 60613

Filed Jul. 18, 1988, Ser. No. 220,250
Int. Cl.[5] B25C *11/00*
U.S. Cl. 254—28 **31 Claims**



1. A staple remover for removing a staple from an object comprising:

an elongate member which is progressively forced under a crown of the staple, said member including

(a) flat lateral sides which are parallel and spaced apart a distance less than the length of the crown of the staple, each said lateral side converging to a tip,

(b) a lower bearing surface at each said lateral side which engages and slides along the object,

(c) an upper camming surface at each said lateral side which engages and slides along the object,

(d) an upper camming surface at each said lateral side which diverges from an associated said lower bearing surface at the associated tip and upon which the crown of the staple slides to force the crown of the staple away from the object, and

(d) a protrusion sticking out from each said flat lateral side between the associated said camming surface and bearing surface, the distance between the protrusions being greater than the length of the crown of the staple; and each said protrusion of the associated said lateral side (i) ending at a distance from the associated camming surface which is less than the length of a leg of the staple; and (ii) extending generally parallel to the associated said camming surface from adjacent the tip of the associated said lateral side to a maximum protruding height which maximum height occurs where the distance between the associated said camming surface and bearing surface is approximately 40 to 60% of the length of a leg of the staple.

4,944,492

WEDGE-TYPE JACK APPARATUS FOR RAISING STRUCTURE WHILE SUSTAINING VERY LARGE PRESSURE DUE TO SAME AND TEMPORARILY SUPPORTING THE STRUCTURE

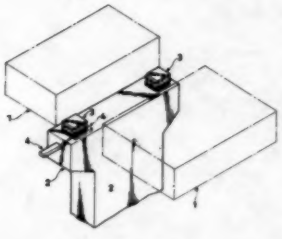
Haruo Nonaka, Sakai, Japan, assignor to Matsuo Engineering Co., Ltd., Osaka, Japan

Filed Jun. 22, 1989, Ser. No. 369,972

Claims priority, application Japan, Jun. 24, 1988, 63-157469; Jun. 25, 1988, 63-84331[U]

Int. Cl.[5] B24B *41/06*

U.S. Cl. 254—104 8 Claims



1. A wedge-type jack apparatus comprising:

a wedge-like drive member restricted in movement in a widthwise direction and having inclined surface on both upper and lower sides,

a lower member having on the upper side an inclined surface substantially commensurate with the inclined surface on the lower side of said wedge-like drive member and restricted in movement in both widthwise and lengthwise directions,

an upper member having on the lower side an inclined surface substantially commensurate with the inclined surface on the upper side of said wedge-like drive member and restricted in both widthwise and lengthwise directions,

push means for applying a lontitudinal pushing force to said wedge-like drive member to move said drive member longitudinally between said inclined surfaces of said lower and upper members, and

stopper means independent of said push means for preventing movement of said wedge-like drive member out of a state between said lower and upper members to which pushed by said push means.

4,944,493

POST AND RAIL ASSEMBLY

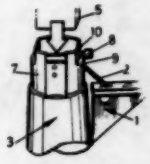
Keith Handy, Blackburn, United Kingdom, assignor to Glasdon Group Limited, United Kingdom

Filed Aug. 8, 1988, Ser. No. 229,937

Claims priority, application United Kingdom, Aug. 8, 1987, 8718857

Int. Cl.[5] E04H *17/00*

U.S. Cl. 256—23 5 Claims



1. A post and rail assembly comprising:

a rail;

a first end of a flexible tether secured to said rail;

a hollow upwardly open-ended post provided with a tether aperture through which said flexible tether may be passed;

a second end of said tether having an enlarged head which in at least one orientation with respect to said aperture in said post is too large to pass therethrough;

and a locking element releasably engageable within said open end of said post to restrict said aperture and both prevent passage of said enlarged head therethrough and removal of said first end of said tether therefrom.

4,944,494

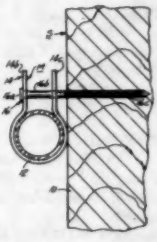
FENCE STRUCTURE

Robert J. Pendleton, 6465 Edgewood, Brighton, Mich.

Filed Sep. 22, 1989, Ser. No. 410,812

Int. Cl.[5] E04H *17/14*

U.S. Cl. 256—68 1 Claim



1. A fence structure for containing horses and the like, comprising a plurality of vertical wooden posts, a plurality of horizontal metal rails disposed in parallel relation upon said posts, clamp means engageable with each of said rails, each of said clamp means including a generally semi-circular body portion and a pair of smooth-surfaced apertured flange portions extending outwardly and upwardly therefrom in spaced relation to one another and to said vertical posts, and nail means received in the aperture in each of said flange portions and grippingly engageable with said vertical wooden posts in substantial penetration thereinto.

4,944,495

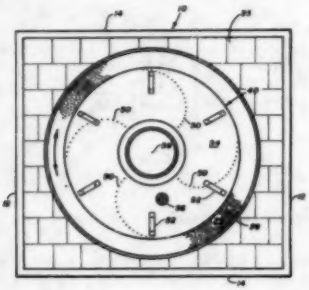
METHOD AND APPARATUS FOR LEVELING A REFRACTORY BED SURFACE

Robert H. Johns, Natrona Heights, and J. Richard Rzomp, Brackenridge, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1989, Ser. No. 303,867

Int. Cl.[5] C21D *9/00*

U.S. Cl. 266—100 **10 Claims**



10. Apparatus for flattening and leveling a support surface of refractory pebbles forming a refractory bed upon a floor portion of a tunnel furnace car for supporting a coil of strip, said apparatus including:

disk means having a flat face surface suitable for establishing a flat coil support site on the refractory bed;

a plurality of tooth members carried by said disk means to project from said flat face surface for moving refractory pebbles about the refractory bed, said plurality of tooth members being arranged in a series of helical patterns about a central axis corresponding to a geometrical center of said disk means;

means mounted upon a surface of the disk means opposite said flat face surface for rotating said disk means about a circular path having a vertical axis generally corresponding to said geometrical center to cause the plurality of tooth members to engage with individual ones of the refractory pebbles in a manner to thereby redistribute the pebbles of the refractory bed and cause the refractory pebbles to conform to the flat bottom surface of the disk means; and

means supported by said disk means for visually displaying a measure of the levelness of the refractory bed surface established by operation of said disk means for supporting a coil of strip material.

4,944,496

APPARATUS FOR INJECTING GAS INTO HIGH TEMPERATURE LIQUIDS, E.G. MOLTEN METALS

Anthony Thrower, Dronfield Woodhouse, and John R. Gelsthorpe, Sheffield, both of England, assignors to Injectall Limited, Sheffield, England

PCT No. PCT/GB88/00271, § 371 Date Dec. 29, 1988, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/08041, PCT Pub. Date Oct. 20, 1988

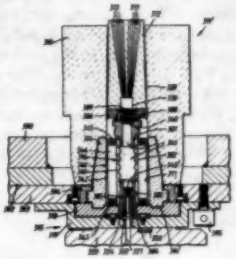
PCT Filed Apr. 8, 1988, Ser. No. 274,528

Claims priority, application United Kingdom, Apr. 10, 1987, 8708673; Jan. 22, 1988, 8801455

Int. Cl.[5] C21C *5/34*

U.S. Cl. 266—220 **43 Claims**

1. An injection nozzle for installation in a wall of a vessel, for use in introducing gas into liquid contained therein, the nozzle comprising a body pierced by a passage which is terminated at a discharge end of the nozzle by a gas-porous or foraminous passage-closing means, the nozzle including means gas-tightly affixed to the closing means to feed gas thereto, and the gas-feeding means including a duct structure which extends along the passage between the closing means and an inlet end of the body, the duct structure providing a substantially leak-tight



gas-feed path from an external gas delivery means to the passage-closing means, and the said structure being adjustable or extensible in length.

4,944,497

FLUSHING BLOCK

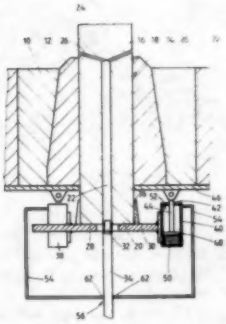
Bernd Grabner, Millstatt, Austria; Lorenz Dötsch, Vallendar, Fed. Rep. of Germany; Josef Knauder, Eitweg, Austria, and Hans Höffgen, Hör-Grenzhausen, Fed. Rep. of Germany, assignors to Radex-Heraklith Industriebeteilgungs AG, Austria

Filed Mar. 21, 1989, Ser. No. 326,295

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809828

Int. Cl.[5] C21B *7/072*

U.S. Cl. 266—268 **16 Claims**

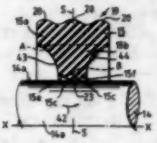


1. Flushing block having a circumferential surface for introducing gases alone or together with solid reagents and additives into a metallurgical melting vessel, said flushing block being connectable to at least one drive means, said flushing block having at a first end an inlet opening, and at its opposite second end having at least one outlet opening extending from the circumferential surface of said flushing block, gas channel means formed in said flushing block extending longitudinally through said flushing block and connecting the outlet opening with the inlet opening for conveying gases alone or together with solid reagents and additives through said flushing block to the interior of the metallurgical melting vessel, and means at the inlet opening of the gas channel means for connecting the gas channel means to a gas supply pipe.

4,944,498
GAS SPRING

Bernd Körtgen, Adenau; Helmut Morgen, Mauseback; Heinz-Josef Heinrichs, Koblenz-Metternich; Castor Fuhrmann, Brachtendorf, and Herbert Freitag, Koblenz-Metternich, all of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,671
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723654
Int. Cl.[5] F16F 9/36
U.S. Cl. 267—64.11 30 Claims



1. A gas spring comprising a container tube (11) which has an axis and two ends and defines a cavity, piston rod guide means (18) at at least one end of the container tube (11), a piston rod (18) guided in axial direction (X—X) of the container tube (11) through said piston rod guide means (18), and sealing means (15,17) adjacent to said at least one end, said sealing means comprising a first axially outer sealing unit (17) and a second axially inner sealing unit (15),

said second sealing unit (15) comprising a sealing ring (15) of homogeneous elastomeric material,

said sealing ring (15) being in sealing engagement with an internal circumferential surface (11*a*) of said container tube (11) and in sealing engagement with an external circumferential surface (14*a*) of said piston rod (14),

a liquid chamber (13) being defined between said first sealing unit (17) and said second sealing unit (15),

said liquid chamber (13) containing a liquid,

a working space (12) being defined between said second sealing unit (15) and the other one of said two ends of said container tube (11),

said working space (12) containing a volume of pressurized gas,

said sealing ring (15) comprising—when regarded in a sectional plane containing said axis (X—X) of said container tube (11)—a radially outer root portion (15*a*) and a radially inner lip portion (15*b*),

said root portion (15*a*) engaging said internal circumferential surface (11*a*) of said container tube (11) in at least two axially spaced radially outer annular contact areas separated from each other by at least one radially outer annular non-contact area, with the radial dimension of said root portion (15*a*) being less than about 50 percent of the radial distance between said external surface (14*a*) of said piston rod and said internal surface (11*a*) of said container tube,

said lip portion (15*b*) engaging said external circumferential surface (14*a*) of said piston rod (14) in one single radially inner annular contact area, with the axial dimension of said lip portion (15*b*), as measured at a radial location spaced from the external surface (14*a*) by a distance of approximately 10–20% of the radial distance between the external surface (14*a*) and the internal surface (11*a*), being less than about 50 percent of the axial length of said root portion (15*a*),

said sealing ring (15) being axially movable with respect to said internal circumferential surface (11*a*) of said container tube (11),

said one single radially inner contact area being located axially between said at least two radially outer contact areas, and

said sealing ring (15) being free at both of its axially spaced end faces of rigid reinforcement members connected thereto for common axial movement.

4,944,499
DAMPER DISK

Hiromi Tojima, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 1, 1989, Ser. No. 304,632
Claims priority, application Japan, Feb. 10, 1988, 63-16712[U]
Int. Cl.[5] F16F 1/14; F16D 47/02, 3/66
U.S. Cl. 267—154 6 Claims

1. A damper disk comprising:

an output hub;

an annular intermediate member disposed around said output hub;

an annular spring seat member disposed around said intermediate member, and including spring seats which project radially inwardly;

a pair of annular input plates disposed at opposite sides of said intermediate member and around said output hub;

a plurality of circumferentially spaced pairs of input springs which circumferentially connect said input plates and said intermediate member to each other, said input springs in each pair being arranged circumferentially in series with said spring seats therebetween;

a plurality of circumferentially spaced output springs which circumferentially connect said intermediate member and said output hub to each other, said output springs being formed by compressible coil springs extending substantially in the circumferential direction of said damper disk;

a sub-plate fixed to said intermediate member for holding said output springs and a flange on said output hub and connected to said sub-plate through said output springs so that said intermediate member and said output hub are connected together through said sub-plate, said output springs and said flange in said output hub; and

stop means for restricting relative rotation between said input plates and said spring seat member, between said spring seat ember and said intermediate member and between said intermediate member and said output hub.

4,944,500
TRANSLATION LOCK FOR SURGICAL TABLE WITH DISPLACEABLE TABLETOP

Wolfgang Mueller, and Arthur T. Nagare, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Apr. 7, 1987, Ser. No. 35,529
Int. Cl.[5] A61G 13/00
U.S. Cl. 269—322 6 Claims

1. A table for medical use comprising:

a. an elongated tabletop formed of a radioluscent material and having a patient support surface, said surface having a longitudinal axis and a lateral axis;

b. a base member;

c. carriage means supported by said base member and supporting said tabletop for movement along said longitudi-

nal axis and said lateral axis, said carriage means comprising:

(i) a first carriage having lateral translation channels;

(ii) first roller means attached to said base member and configured to allow said first carriage to be supported by and moved thereon along said lateral axis;

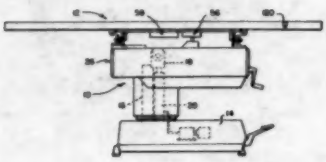
(iii) a second carriage means having longitudinal channels, said second carriage being affixed to the underside of said tabletop;

(iv) second roller means attached to said first carriage and configured to allow said second carriage to be supported by and moved thereon along said longitudinal axis;

d. lateral locking means comprising:

(i) a first locking shaft supported by said base member and in facing relation to said first carriage;

(ii) means for moving said first locking shaft into and out of engagement with a portion of said first carriage, said means for moving comprising:



(a) a first bracket mounted on said base member;

(b) a first rotary solenoid mounted on said first bracket and having a rotational output;

(c) first linkage means connected between said rotational output of said first rotary solenoid and said first locking shaft such that the rotational output of said first rotary solenoid causes said first linkage means to move said first locking shaft to be retracted from engagement with said first carriage; and

(d) first spring means coupled between said first bracket and said first locking shaft so as to normally urge said first locking shaft toward said first carriage; and

e. longitudinal locking means comprising:

(i) a second locking shaft supported by said first carriage and in facing relation to said second carriage;

(ii) means for moving said second locking shaft into and out of engagement with a portion of said second carriage.

4,944,501

EXAMINATION BED FOR NMR OR TOMODENSITOMETRY APPARATUS

Jacques Sireul, Wissous, and René Gauthier, Antony, both of France, assignors to General Electric CGR SA, Issy les Moulineaux, France

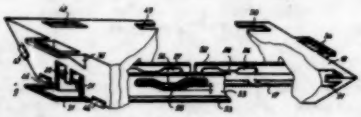
PCT No. PCT/FR87/00278, § 371 Date Mar. 9, 1989, § 102(e) Date Mar. 9, 1989, PCT Pub. No. WO88/00451, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 10, 1987, Ser. No. 313,976

Claims priority, application France, Jul. 18, 1986, 86 10475

Int. Cl.[5] A61G *13/00*

U.S. Cl. 269—322 **10 Claims**



1. An examination bed, notably for a NMR or tomodensitometry apparatus, which comprises:

a chassis;

an examination plateau;

moving assembly means for moving the plateau with respect to the chassis and said apparatus; and

means for translating said moving assembly means with respect to said plateau, said chassis and said apparatus, said moving assembly means being elongated in shape, a first end of said moving assembly means including means for mechanically connecting said moving assembly means to said chassis and including means for moving said first end in translation with respect to said chassis and a second end of said moving assembly means including means for providing mechanical motion connection of said moving assembly means to the plateau, and means for moving said second end in translation with respect to said plateau wherein said means for translating said moving assembly means is connected to said moving assembly means.

4,944,502

CARD WEBBER

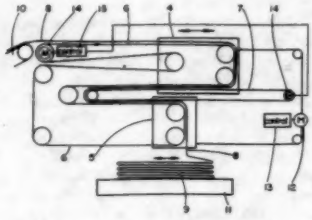
Kurt Platzer, Friedberg; Herwig Hirschek, Bobingen; Edwin Schaller, Langweid, and Helmut Holzinger, Augsburg, all of Fed. Rep. of Germany, assignors to Autefa Maschinenfabrik GmbH, Friedberg, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,542

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738190

Int. Cl.[5] B65H *29/46*

U.S. Cl. 270—31 **10 Claims**



1. A card webber including at least two rotating conveyor belts and including two reversibly movable folding carriages which are accelerated at the reversal points of their paths, wherein a drive for the conveyor belts and a drive for the folding carriages include independent actuators and the velocity of the belt conveyor and the velocity of the folding carriages between the acceleration phases may be adjusted at different velocities relative to one another said actuators each being servo-actuators, at least one of said actuators having a fully programmable controlling means.

4,944,503

DIVISION SHEET FEEDING APPARATUS AND METHOD

Shinichi Arima, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 200,151, May 26, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 442,467

Claims priority, application Japan, May 26, 1987, 62-128849

Int. Cl.[5] B65H *33/04*

U.S. Cl. 270—95 **4 Claims**

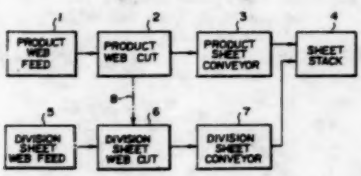
1. A division sheet feeding apparatus for laying at least one division sheet upon a stack of a predetermined number of product sheets each time the predetermined number of product sheets are stacked one upon another, comprising:

a product web;

means for cutting said product web into product sheets;

means for feeding said product web to said cutting means for

cutting said product web into product sheets of a predetermined product sheet size;
means for determining whether product sheets cut from said product web by said cutting means are cut to said predetermined product sheet size;
means for stacking said product sheets;
means for counting a number of product sheets stacked by said stacking means;
a division web;



means for cutting said division web into division sheets of a predetermined division sheet size which is at least the same size as said predetermined product sheet size;
means for determining whether said division sheets are cut to said predetermined division sheet size; and
means for feeding at least one of said division sheets onto said stack when said counting means reaches a predetermined count.

4,944,504

DOCUMENT FEEDING APPARATUS

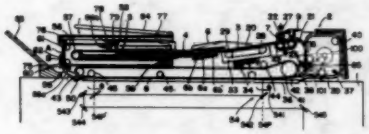
Yasushi Yamada; Yoshikazu Maekawa; Hiroyuki Arai; Susumu Okui; Tsugio Hirabayashi, all of Hachioji, and Toshihide Miura, Koganei, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,302

Claims priority, application Japan, Feb. 13, 1987, 62-29846; Mar. 25, 1987, 62-70750; Mar. 25, 1987, 62-70755; Mar. 25, 1987, 62-70756

Int. Cl.[5] B65H *1/06*

U.S. Cl. 271—171 **9 Claims**



1. A document feeding apparatus for circulating at least one document having a leading edge and a trailing edge, said apparatus comprising a movable regulating member adapted to contact and position said trailing edge, a paper feeding unit downstream of said regulating member, a movable recirculating discharge means comprising a substantially C-shaped flexible guide at least partially surrounding a rear portion of a document stacker and adapted to move downstream and/or upstream based upon movement of said regulating member, and detection means for determining the position of said regulating member.

4,944,505

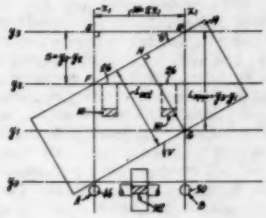
SHEET LENGTH DETECTOR WITH SKEW COMPENSATION

William Sherman, III, Medford, N.J., assignor to Brandt, Inc., Bensalem, Pa.

Filed Jan. 30, 1989, Ser. No. 303,248

Int. Cl.[5] B65H *43/00*

U.S. Cl. 271—265 **14 Claims**



1. In a sheet feeder having first means for advancing a sheet along a path having a centerline to a nip formed by second feed means in which said sheet is subject to slippage relative to said first feed means before reaching said nip, apparatus for detecting sheet length including in combination a pair of sheet sensors disposed at transversely spaced locations along said path on either side of said centerline, each of said sensors being actuatable between two distinct conditions, means for producing a first signal in response to the actuation of both of said sheet sensors to the same one of said conditions by the leading edge of a bill, means for producing a second signal in response to the actuation of both of said sheet sensors to the other one of said conditions by the trailing edge of the bill and means responsive to said first and second signals for providing a measure of sheet length.

4,944,505

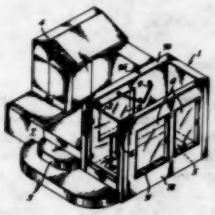
EXERCISE DEVICE WITH UNDERWATER TREADMILL

Jeff Keller, and Robert Linton, both of Edmonds, Wash., assignors to Edmonds Medical Systems, Inc., Edmonds, Wash.

Continuation of Ser. No. 163,174, Feb. 26, 1988, abandoned, which is a continuation of Ser. No. 13,835, Feb. 12, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,656

Int. Cl.[5] A63B *22/02*

U.S. Cl. 272—69 **1 Claim**



1. A kit for making an exercise therapy device of the type having a water tank including a treadmill, said kit comprising a unitary base unit having an open-topped central cavity for the treadmill, said base unit having an integral peripheral trough extending around the bottom portion of the remainder of said base unit and an upper horizontal support and mounting flange encircling the upper portion of said central cavity, said horizontal supporting and mounting flange being disposed upward and inward from said pheripheral trough, separate sidewall panels and end panels each having a bottom horizon-

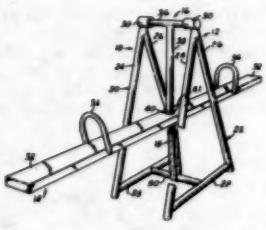
tal flange adapted for bolting to said horizontal support and mounting flange of said base unit and having flat, upright, opposite edge portions adapted for bolting to each other to form a composite exercise tank for receiving a user supported on the treadmill, a water storage container adapted to be connected with its interior in communication with said composite exercise tank, one of said end panels forming an upright frame member, a door member and hinges mounting said door member on said frame member for swinging about an upright edge portion to said exercise tank, and means for locking said door member in closed position, said hinges and locking means being constructed and arranged to permit outward-translating movement of said door member by pressure of water against it as the exercise tank is filled without applying stress to said hinges or locking means, said locking means including a lever pivoted to said frame member for swinging about a horizontal axis, an elongated upright link moved substantially vertically by pivoting movement of said lever, at least two bell cranks each having an apex portion pivoted to said frame member for swinging of said bell cranks about a horizontal axis, each of said bell cranks having a generally horizontally extending leg pivoted to said upright link and a generally upright leg, a plurality of horizontally elongated locking pins, one for each of said bell cranks, each of said pins being connected to said upright legs of said bell cranks for movement therewith, said pins being positioned for substantially horizontal movement so as to project from said frame member by swinging movement of said bell cranks caused by vertical movement of said upright link and bracket means mounted on said door member for receiving said pins and having holes sized so as to permit the translating movement of said door member relative to said frame member.

4,944,507

EASY GLIDE FUN RIDE

Ernest Efstratis, 6775 Wing Lake Rd., Birmingham, Mich. 48010

Filed Nov. 13, 1989, Ser. No. 434,367
Int. Cl.[5] A49B *39/00*
U.S. Cl. 272—85 **12 Claims**



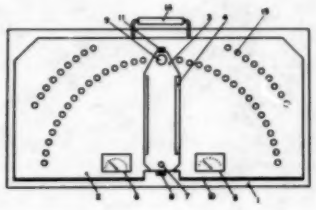
8. A glider especially for children, comprising a supporting frame having laterally spaced apart A-frame uprights, said uprights being disposed in parallel, generally vertical planes and each comprising a pair of legs connected at the tops, said legs diverging downwardly from the tops so as to be spaced apart at the bottoms, the bottoms of said legs being engageable with the ground to provide a base, an elongated rider board between said uprights having a seat portion at each end, means suspending said board from said supporting frame for swinging movement in a vertical plane generally parallel to the planes of said uprights in opposite directions from a generally horizontal position comprising a T-bar, aligned bearing sleeves at said tops of the legs of said uprights defining a horizontal pivot axis, said T-bar having a horizontal cross member the ends of which are received in said respective bearing sleeves for turning movement about the pivot axis of said bearing sleeves, said T-bar having a central member extending from the midpoint of said cross member at right angles thereto, means connecting said central member to said board approximately midway between the ends thereof, a beam connecting the bottoms of the legs of each upright, a brace connecting said beams, and means urging said board to said generally horizontal position including an elongated, stretchable elastic member looped under said brace and having the ends thereof connected to said board adjacent the midpoint in the length of the latter.

4,944,508

SHOULDER REHABILITATION DEVICE

Jayson H. Collins, 5804 Parkwood, Austin, Tex. 78735

Filed Aug. 10, 1989, Ser. No. 392,307
Int. Cl.[5] A63B *21/015*
U.S. Cl. 272—132 **5 Claims**



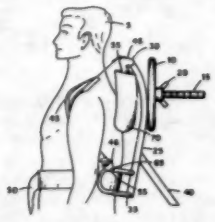
1. A multi-angle shoulder rehabilitation unit comprising:
(a) a base plate;
(b) a mounting plate means hingedly attached to said base plate with adjustable means to rigidly hold said mounting plate means in a multiplicity of different positions from horizontal to vertical;
(c) a lever means affixed at a lower end with a pivotal mounting means to said mounting plate means;
(d) a gripping handle means mounted at right angles to and in the upper end of said lever means; a multiplicity of holes in said mounting plate means, wherein said gripping handle means is movably mounted within said lever means to engage any one of said multiplicity of holes in said mounting plate means;
(e) a forearm cradle means mounted on said lever means between said gripping handle mounting means and said pivotal mounting means; and
(f) a tension adjustment means to adjust resistance to motion of said lever means.

4,944,509

WEIGHTLIFTING BACKPACK

John M. Salder, 9544 Sarasota Dr., Knoxville, Tenn. 37923

Filed Apr. 27, 1989, Ser. No. 343,576
Int. Cl.[5] A63B *21/065*
U.S. Cl. 272—119 **7 Claims**



1. A weight lifting device for firmly securing standardized barbell weights having a central hole extruding therethrough

to the upper posterior portion of a user's body, said device comprising:

a back frame including

(a) a shoulder-spanning portion for extending across the upper portion of a user's back from a location adjacent the user's right shoulder to a location adjacent the user's left shoulder;

(b) a lower back-spanning portion for extending across the lower back of the user from a location adjacent the user's right side to a location adjacent the user's left side; and

(c) elongate means for connecting the shoulder-spanning portion to the lower back-spanning portion including upper and lower ends, said elongate means fixed at its upper end to the shoulder-spanning portion and fixed at its lower end to the lower back-spanning portion and extending generally along the center of the user's back when the device is operatively worn;

a weight-carrying bar associated with the frame about which standardized barbell weights can be positioned, said weight-carrying bar being fixed to the frame so as to project generally rearwardly thereof from a location adjacent the upper end of the elongate means and adapted to receive the weights placed thereon as the hole in each weight is directed onto the rearwardly-projecting end of the weight-carrying bar and the weight is positioned adjacent the frame;

clamp means associated with the weight-carrying bar for securing the weights in place along length of the weight-carrying bar; and

strap means securable about the frame for firmly securing the frame against the back of the user so that when the frame is firmly secured against the user's back, the center of gravity of the weights positioned on the weight-carrying bar is located adjacent the user's back at a location substantially midway between the user's shoulder blades.

4,944,510

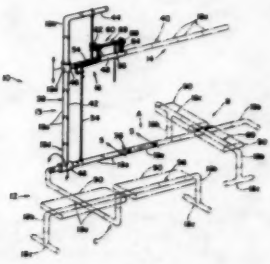
EXERCISE APPARATUS

Dennis L. Brady, 2130 Huntington Dr., #311, S. Pasadena, Calif. 91030

Filed Jul. 27, 1987, Ser. No. 77,805

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—133 **18 Claims**



1. An exercise apparatus comprising:

a base member,

a support member including an elongate portion having normally upper and lower ends, and an end portion extending laterally from one end of said elongate portion,

means at the other end of said elongate portion of said support member mounting said support member on said base member,

a rope having one end secured to said laterally extending end portion of said support member, its other end secured to said base member, and an intervening portion extending between said upper and lower ends of and spaced laterally from said elongate portion of said support member,

an exercise member movable in an exercise motion back and forth along said intervening portion of said rope, and

friction brake means on said exercise member frictionally engageable with said rope for resisting said exercise motion.

4,944,511

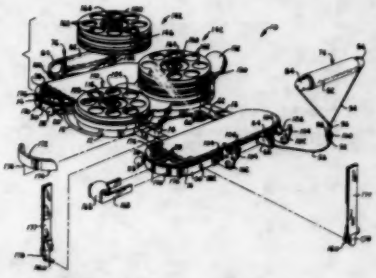
ADJUSTABLE RESILIENT REEL EXERCISER

Paul S. Francis, 4603 Homestead Dr., Prairie Village, Kans. 66208, assignor to Paul S. Francis, Prairie Village, Kans.

Filed Jan. 23, 1989, Ser. No. 300,563

Int. Cl.[5] A63B *21/02*

U.S. Cl. 272—137 **21 Claims**



1. An exercising device comprising:

a portable base adapted to rest on a support surface and providing a pair of spaced apart foot pads for receiving the feet of the user;

a pair of reels supported for rotation on the base independently of one another, each reel being rotatable about a rotational axis oriented substantially perpendicular to said foot receiving surfaces;

a pair of flexible lines wound around the respective reels in a manner to rotate the reels when the respective lines are pulled;

a hand grip on each line, said hand grips being situated on opposite sides of said base at locations accessible to the hands of a user standing on said foot pads; and

resilient resistance means for each reel acting thereon in a manner to resist rotation of the reel in a direction caused by pulling on the corresponding line, the resilient resistance means for each reel acting independently of the resilient resistance means for the other reel.

4,944,512

GAME APPARATUS

Bonnie M. Mauck, and Ronnie L. Mauck, both of 10355 Tomahawk Trail, Colorado Springs, Colo. 80908

Filed Oct. 27, 1989, Ser. No. 427,433

Int. Cl.[5] A63F *9/00*

U.S. Cl. 273—1 GE **4 Claims**

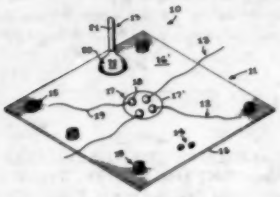
1. A game apparatus consisting of:

a generally flat rectangular game board having a starting location designated on the top surface of the game board;

a plurality of tethered units each comprising a spherical game piece attached to one end of an elongated elastic tether; and,

a capture unit comprising an inverted receptacle member dimensioned to cover a portion of the top surface of the

game board, and having a handle element; whereby, the spherical configuration of the game piece will prevent the



game piece from becoming caught between the periphery of said inverted receptacle member and the game board.

4,944,513

BALL BATTING GAME APPARATUS

John R. Zentner, 22442 Bessemer, Woodland Hills, Calif. 91367

Filed Mar. 7, 1989, Ser. No. 321,294

Int. Cl.[5] A63B *69/40*

U.S. Cl. 273—26 R **28 Claims**

1. A ball batting game apparatus for playing with two players comprising:

(a) a pair of spaced-apart line-attaching members positioned at a predetermined distance,

(b) a line between and contiguous with said attaching members above a ground surface providing a directional guide therebetween,

(c) line tensioning means connected between the line and the attaching members causing the line to be taut defining a relatively straight linear guide between the members,

(d) a ball having a hole in the center thereof disposed on the line through the hole allowing the ball to move freely on the line in a linear direction,

(e) a ball striking device held by a player having extended fingers on one end and a gripping surface on the other providing a striking force to propel the ball along the line when hit by the player, with the fingers penetrating either side of the line hitting only the ball when the player arcuately swings the striking device, and

(f) a bifurcated ball launching implement held by the other player, the implement having forks on one end and a handle surface on the other allowing the remaining player to orientate the forks on the line contiguous with the ball and propel the ball with a flip of the player's wrist to the player having the striking device in a pitching manner allowing the striking device to be swung impacting the ball thrusting it back toward the remaining player in a hitting manner duplicating, in constraint, a game using a ball and a bat or racket.

4,944,514

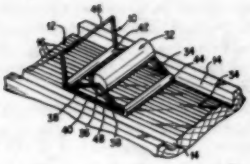
FLOOR FINISHING MATERIAL AND METHOD

James R. Suiter, Omaha, Nebr., assignor to Suitco Surface, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 940,428, Dec. 11, 1986, Pat. No. 4,795,152, and a continuation-in-part of Ser. No. 203,617, Jun. 6, 1988, Pat. No. 4,867,816, which is a continuation of Ser. No. 871,318, Jun. 6, 1986, abandoned. This application Dec. 13, 1988, Ser. No. 283,863

Int. Cl.[5] A63C *19/04*; A63D *1/04*

U.S. Cl. 273—51 **8 Claims**



4. On a floor having a flat top surface and an improved material for finishing the top surface of the floor, the improvement comprising:

at least one elongated sheet including a uniform flexible film of clear plastic material having a thickness between about one mil and about twenty-five mils and

a continuous layer of adhesive material disposed between the top surface of the floor and the flexible film, the adhesive layer releasably adhering the flexible film onto the top surface of the floor.

4,944,515

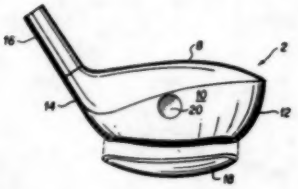
HOLLOW GOLF CLUB HEAD WITH INTERNAL SUPPORT

William B. Shearer, 2905 W. Main St., Muncie, Ind. 47305

Filed Jan. 4, 1989, Ser. No. 293,451

Int. Cl.[5] A63B *53/04*

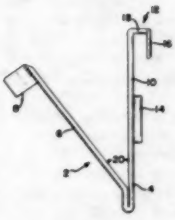
U.S. Cl. 273—167 H **6 Claims**



1. A hollow golf club head having a face, a back, a toe, a heel, a top and a bottom which comprise the exterior surface of said club head wherein said club head has an interior comprising a cavity having a dimension conforming to the general exterior surface configuration of said club and a linear support member extending between an internal surface of the face of said club head and an internal surface 9 of the back of said club head and wherein the exterior surface of the bottom has a substantially planar surface and wherein said linear support member has a longitudinal axis which is substantially parallel to said planar surface wherein said face of said club head has a substantially planar surface having a geometric center and wherein said linear support member abuts said internal surface of said face at said geometric center, said linear support member having a first end and a second end and a cavity extending from the first end of said linear support member through the second end of said linear support member and wherein said cavity in said linear support member extends through the back exterior surface of said club whereby said cavity of said linear

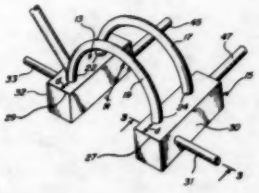
support member is visible from the exterior of said club head, whereby abutment of said linear support member against the internal surfaces of the face and back affords increased structural integrity to retard deformation of the club head during an impact.

4,944,516
PUTTING TRAINER DEVICE
Henry A. Bickler, 45-750 Pueblo Rd., Indian Wells, Calif. 92210
Filed Oct. 23, 1989, Ser. No. 425,574
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 B 9 Claims



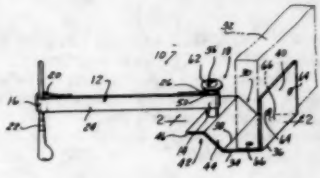
1. The device includes an attachment member which runs along the grip of the putter, terminating in a J-hook shaped member designed to engage a hole found in the top of a standard putter grip means for attachment comprising an attachment member connected to the angled member at one end and terminating in a J-hook member at the other end, said J-hook member being adapted to be inserted into a hole at the top of the grip wherein when the device is installed on a putter, the attachment member sits along the putter grip.

4,944,517
GOLF PRACTICE CLUB
Robert H. Redkey, 1630 Maple, Solvang, Calif. 93463
Filed Dec. 6, 1989, Ser. No. 446,930
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 A 8 Claims



1. A golf practice club for practice swinging at a golf ball comprising:
- first and second block means for providing a channel therebetween, said block means each including a respective hole in a top surface thereof;
- at least one arched ring means having first and second extensions thereon for insertion respectively in one of said holes; and
- said first and second block means and said at least one arched ring providing an opening for passing over said golf ball without touching said ball when a proper swing is made.

4,944,518
GOLF SWING PRACTICE AND EXERCISE APPARATUS
William R. Flynn, 1707 Three Lakes Dr., Troy, Mich. 48098
Filed May 22, 1989, Ser. No. 355,193
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 A 2 Claims



1. A golf swing exercise apparatus for practicing a golf club swing comprising:
- an elastic bond having first and second ends, the elastic band exerting a resistance to extension from a normal unextended length;
- bracket means mountable to a stationary surface;
- first means for attaching the first end of the band to the bracket means; and
- second means in the form of a loop formed on the second end of the band for removably attaching the second end of the band to the shaft of a golf club, said bracket means comprising:
- a planar base having opposed side edges;
- a leg contiguous with the base and extending substantially perpendicular to one side edge of the base;
- the base and leg configured for engagement with a stationary surface;
- a support extending outward from the other side edge of the base;
- a post fixedly connected to and extending substantially perpendicular from the support parallel to the leg, the first attaching means removably attachable about the post.

4,944,519
BOARD GAME FOR MEMORIZING MESSAGES, SLOGANS OR PHRASES
Heriberto Canela, 8027 W. 14 Avenue, Hialeah, Fla. 33014
Filed Aug. 14, 1989, Ser. No. 393,207
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—243 3 Claims

1. A board game, comprising:
- A. a board member having an upper surface with a plurality of peripheral spaces with a corresponding plurality of centrally disposed spaces defined thereon and said centrally disposed spaces having one message each;
- B. a stack of cards, twice in number as said plurality of

centrally disposed spaces, wherein said cards are matched in pairs wherein each one of said matching cards in a pair include complementing parts of said messages;

C. a plurality of player token means that are used to represent each one of the players;

D. dice means for randomly reading symbols to be used to advance said player token means along said peripheral spaces; and

E. a plurality of matched pair token means for indicating the pairs of cards matched by a player.

4,944,520

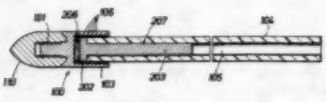
ARROW SHAFT END ADAPTOR APPARATUS AND BALANCE PIN APPARATUS AND METHOD

Conrad F. Fingerson; Bruce A. Nelson, both of Chatfield; Dennis L. Carlson, Brooklyn Park, and Robert D. Eickhoff, Fountain, all of Minn., assignors to AFC, Inc., Chatfield, Minn.

Continuation-in-part of Ser. No. 102,028, Sep. 29, 1987, Pat. No. 4,874,180. This application Sep. 26, 1988, Ser. No. 248,216

Int. Cl.[5] F42B *6/04*

U.S. Cl. 273—419 **2 Claims**



1. An arrow, comprising:

(a) a hollow circular arrow shaft having a first end and a second end and an opening with an inner surface defined therethrough,

(b) a single piece end adaptor for operative engagement to said hollow circular arrow shaft, said end adaptor having:

a cylindrical body having a ferrule end and an externally threaded end,

said ferrule end having an outer diameter and a cylindrical bore with a continuous inner surface defined upwardly therein, the inner surface of said bore adhesively engageable about a portion of the first end of the circular arrow shaft;

said externally threaded end opposite said ferrule end having constant pitch and constant diameter external threads defined thereabout, and an inclined surface defined in a circular manner about the intersection of said ferrule end and said externally threaded end, said inclined surface tapered inward from said outer diameter of said ferrule end towards said bore of said ferrule end, said inclined surface having an inner diameter greater than the diameter of the constant diameter external threads, said external threads and said inclined surface formed to threadedly receive and retain an arrow point with cooperating constant pitch and constant diameter internal threads and inclined surface so that impact forces from the arrow point are not transmitted to the inner surface of said circular arrow shaft, and

(c) a balance pin having a shaft portion with an outer diameter smaller than said opening defined through said arrow shaft, said balance pin shaft portion being received in a portion of said opening of said arrow shaft; and

a head portion interconnected to one end of said balance pin shaft portion having a diameter greater than said balance pin shaft portion outer diameter, said balance pin head portion diameter being smaller than the inner diameter of said first ferrule end.

2. A method of making an arrow comprising the steps of:

providing a hollow circular shaft having a first end and a second end and an opening with an inner surface defined therethrough,

providing a single piece end adaptor having:

a ferrule end with an outer diameter and a cylindrical bore with a continuous inner surface defined upwardly therein, the inner surface of said bore adhesively engageable about a portion of the first end of said hollow circular shaft; and

an externally threaded end opposite said ferrule end, said externally threaded end having;

constant pitch and constant diameter external threads defined therabout, and

an inclined surface defined in a circular manner about the intersection of said ferrule end and said externally threaded end, said inclined surface tapered inward from said outer diameter of said ferrule end towards said bore of said ferrule end, said inclined surface having an inner diameter greater than the diameter of the constant diameter external threads, said external threads and said inclined surface formed to threadedly receive and retain an arrow point with cooperating constant pitch and constant diameter internal threads and inclined surface so that impact forces from the arrow point are not transmitted to the inner surface of said circular shaft,

providing a balance pin having a shaft portion with an outer diameter smaller than said opening defined through said arrow shaft, said balance pin shaft portion sized to be inserted into a portion of said arrow shaft opening, and a head portion interconnected to one end of said balance pin shaft portion having a diameter greater than said balance pin shaft portion outer diameter, said balance pin head portion diameter being smaller than the inner diameter of said first ferrule end,

inserting said balance pin shaft portion in said arrow shaft opening until said balance pin head portion abuts said arrow shaft first end,

adhesively engaging a portion of said inner surface of said bore of said ferrule end to the outer surface of said first end of said hollow circular shaft,

threading an arrow point having an inclined surface on the externally threaded end of said end adaptor, and

contacting said inclined surface of said arrow point with said inclined surface of said externally threaded end.

4,944,521

WAR GAME MARKING GRENADE

Donald R. Greeno, 1 Snowling Rd., Uxbridge, Mass. 01569

Filed Jun. 27, 1989, Ser. No. 371,838

Int. Cl.[5] A63B *71/02*

U.S. Cl. 273—428 **10 Claims**

1. A war game marking grenade comprising,

an elongate housing including a plurality of cavities formed in the exterior surface of the housing, and

a head portion fixedly mounted to an upper end of the housing including an actuator handle pivotally mounted to a forward upper portion of the head portion, and

a piercing head mounted to a lever member wherein the lever member is pivotally mounted to the handle, and

a cylindrical well positioned medially of the housing including a gas cylinder container therein with an upper end aligned with a forward end of the piercing head, and each of the cavities in communication with the well, and each of the cavities including a marking fluid containing capsule secured therein whereupon pivoting of the actuator handle directs the piercing head to effect release of a

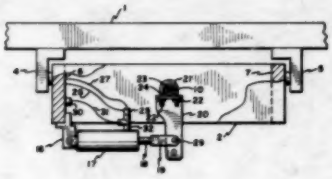
compressed gas contained within the gas cylinder to direct the capsules exteriorly of the housing.

4,944,522

PIN RETRACTOR FOR SEMI-TRAILER TANDEMS

Bobbie M. Hart, P.O. Box 7514, Roanoke, Va. 24019

Filed Sep. 26, 1988, Ser. No. 248,955
Int. Cl.[5] B60G *5/04*; B62D *53/06*
U.S. Cl. 280—149.2 **20 Claims**



1. In a tandem which comprises a pin control shaft, wherein the rotation of said pin control shaft retracts pins on the tandem, the improvement comprising:

a lever arm attached to said pin control shaft by means of gripping the exterior of said pin control shaft at a point where there is no shaft extension, wherein said gripping means comprise two U bolts, an upper pipe segment and a lower pipe segment; and

a pneumatic ram pivotally attached both to the end of said lever arm and to said tandem; and

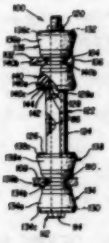
means for activating said ram.

4,944,523

END LINK FOR STABILIZER BAR

Donald P. Hardy, Jr., and Eric C. Parker, both of Algonquin, Ill., assignors to Illinois Tool Works, Chicago, Ill.

Filed Mar. 3, 1989, Ser. No. 318,298
Int. Cl.[5] B60G *11/50*
U.S. Cl. 280—689 **22 Claims**



1. An end link for a stabilizer bar for a suspension system for a motor vehicle, such as an automobile or a light truck, the end link comprising:

(a) a unitary spool having a tubular body and having an annular flange at each end of the tubular body, said flanges conforming in thickness and outer diameter to each other;

(b) two annular washers, each conforming in outer diameter to each of said flanges;

(c) four annular grommets conforming in shape to each other and being made of an elastomeric material, each having a snap-fittable end adapted to be snap-fitted over either of said flanges or over either of said washers, and each having an opposite end;

(d) a bolt having a head and a shank with a threaded end; and

(e) a nut adapted to be threaded onto the threaded end of the shank of the bolt;

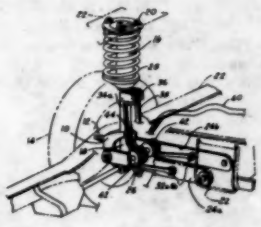
wherein the snap-fittable end of a respective one of said grommets is snap-fitted over each of said flanges, so as to form a grommet-spool-grommet subassembly; wherein the snap-fittable end of a respective one of said grommets is snap-fitted over each of said washers, so as to form a first grommet-washer subassembly and a second grommet-washer subassembly; wherein the shank of the bolt extends successively through the first grommet-washer subassembly, such that the washer of the first grommet-washer subassembly faces toward the head of the bolt, through the grommet-spool-washer subassembly, and through the second grommet-washer subassembly, such that the washer of the second grommet-washer subassembly faces away from the head of the bolt; and wherein the nut is threaded onto the threaded end of the shank of the bolt.

4,944,524

TELESCOPING STRUT SUSPENSION WITH FRICTION REDUCING TORSIONAL UNLOADING DEVICE

Kurt F. Achenbach, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 18, 1987, Ser. No. 122,315
Int. Cl.[5] B60G *17/00*
U.S. Cl. 280—701 **16 Claims**



1. An independent suspension for a motor vehicle comprising:

a wheel carrier including a spindle for rotatably mounting a road wheel;

a telescoping strut having a lower end rigidly attached to said wheel carrier and an upper end attached to the chassis of said motor vehicle;

a control arm interposed between said wheel carrier and said chassis; and

a torsional unloading device comprising a torsion spring interposed between said control arm and said telescoping strut such that said torsional unloading device will impose a force upon said telescoping strut tending to counteract an opposing bending moment imposed upon said strut by said wheel carrier.

4,944,525

SELF LOCKING TRAILER HITCH

Doyle L. Landry, Rt. 46, Box 295, Lafayette, La. 70508

Filed Jul. 3, 1989, Ser. No. 374,876
Int. Cl.[5] B60D *1/44, 1/14*
U.S. Cl. 280—479.3 **5 Claims**

1. A center locking hitch comprising:

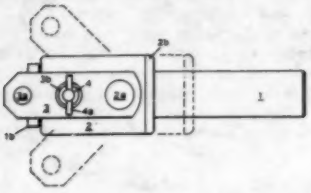
(a) an elongated frame with means for attachment to a vehicle;

(b) a housing with means to attach to said frame for limited longitudinal movement thereon between an extended towing position and a retracted vehicle coupling position wherein said means to attach said housing to said frame comprises a non-circular longitudinal bore in said housing and a cooperating non-circular surface on said frame telescopingly received therein for said limited longitudinal movement;

(c) a swing bar pivotally mounted on said housing for swing-

able movement about a vertical axis, with provisions at a free end for attachment to another vehicle;

(d) said housing, frame, and swing bar each having apertures with such apertures disposed in alignment when said



swing bar is centered on said housing and said housing is in said extended position;

(e) a locking pin mounted on said swing bar for extension through said apertures when they are in alignment to lock the hitch in towing position.

4,944,526

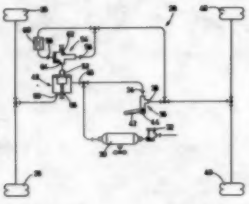
AIR SUSPENSION SYSTEM WITH LOAD CONTROLLED LIFTABLE AXLE

Charles E. Eberling, Wellington, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed May 1, 1989, Ser. No. 345,818

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—704 **7 Claims**



1. Suspension control system for a vehicle having a suspension system including support means using fluid pressure to support said vehicle and a liftable axle carrying wheels, said liftable axle being movable between a ground engaging position in which said wheels carried by the liftable axle engage the ground to assist in supporting the vehicle and a retracted position in which the wheels carried by the liftable axle are retracted from the ground, said suspension control system including valve means responsive to the pressure level in said suspension system to cause said liftable axle to move to the ground engaging position when the pressure level in the suspension system exceeds a predetermined level and to cause said liftable axle to move to the retracted position when the pressure level in the suspension system drops below a predecided level, said liftable axle including fluid pressure responsive means for causing said liftable axle to move between said positions, said valve means including communication controlling means for controlling communication between a source of fluid pressure and the fluid pressure responsive means, said valve means including pressure responsive means responsive to the pressure level in said support means, said pressure responsive means controlling said communication controlling means to communicate said fluid pressure responsive means to said fluid pressure source when the pressure level in the support means attains said predetermined level and to terminate communication between said fluid pressure responsive means and said fluid pressure source when the pressure level in the support means drops to said predecided pressure level.

4,944,527

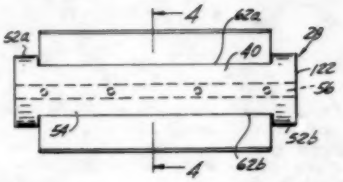
INTEGRAL RETAINER, HEAT SHIELD AND ASSEMBLY

Robert J. Bishop, Washington; Robert P. Fontecchio, Rochester Hills; Stanley B. Good, Richmond, all of Mich., and Troy C. Hendrix, Maryville, Tenn., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 31, 1989, Ser. No. 401,216

Int. Cl.[5] B60R *21/28*

U.S. Cl. 280—741 **20 Claims**



1. A device comprising a planar metal sheet having formed thereon at least a first set of opposing shaped slots such that upon forming the planar sheet as an open ended generally cylindrical member or cylinder first portions of the sheet, defined by the slots, extend away from the surface of the formed cylindrical member and form in conjunction with other surfaces of the sheet a plurality of first apertures, and the extending first portions serving to define heat sheet means for shielding a portion of an air bag, adapted to be secured thereabout, from hot gas generated by a gas generator, the formed cylindrical member adapted to receive a gas generator therein, the device including securement means, interacting with a rearward portion of the cylindrical member and adapted for urging a gas generator into forward facing portions of the cylindrical member, for securing same in place.

4,944,528

AUTOMATIC-IGNITION DEVICE FOR VEHICLE CRASH PROTECTION DEVICE

Karl E. Nilsson, Ottobrunn, and Siegfried Zeuner, Munich, both of Fed. Rep. of Germany, assignors to Bayern-Chemie, Gesellschaft für flugchemische Antriebe mbH, Aschau am Inn, Fed. Rep. of Germany

Filed Jul. 7, 1989, Ser. No. 376,827

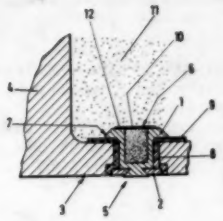
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824469

Int. Cl.[5] B60R *21/26*

U.S. Cl. 280—741 **9 Claims**

1. An automatic-ignition device for a vehicle crash protection device for passengers having a gas generator arranged in a housing, said gas generator comprising a primary igniting mixture ignitable at a low ambient temperature and being embedded in a primary igniting mixture metal housing structure containing a window, the window having a dam and being aligned toward a secondary igniting mixture for generating gas, the primary igniting mixture metal housing structure being

disposed thermally insulated in an outer wall of the gas generator housing such that, in the area of the outer wall, a heat sink



is formed, which is thermally insulated from the gas generator housing.

4,944,529

INFLATABLE PROTECTIVE CUSHION

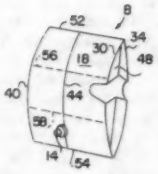
Hans-Gerd Backhaus, Wettstetten, Fed. Rep. of Germany, assignor to Audi AG., Ingolstadt, Fed. Rep. of Germany

Continuation of Ser. No. 941,758, Dec. 15, 1986, abandoned. This application Sep. 13, 1988, Ser. No. 243,438

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544248

Int. Cl.[5] B60R *21/22*

U.S. Cl. 280—743 **16 Claims**



1. An inflatable cushion for the protection of passengers in an automotive vehicle, comprising:

first and second quadrilateral and substantially congruent web means in superposed relation, each web means comprising first and second margins positioned opposited each other and third and fourth margins positioned opposite each other and extending along lines intersecting said first and second margins;

third web means comprising fifth and sixth margins positioned opposite each other and at least a seventh margin extending along a line intersecting said fifth and sixth margins, said fifth and sixth margins being connected to one of said third and fourth margins of said first and second quadrilateral web means and said seventh margin being substantially coextensive with one of said first and second margins of said first and second quadrilateral web means;

fourth web means comprising eighth and ninth margins positioned opposite each other and at least a tenth margin extending along a line intersecting said eighth and ninth margins, said eighth and ninth margins being connected to the other of said third and fourth margins of said first and second quadrilateral web means and said tenth margin being substantially coextensive with said one of said first and second margins of said first and second quadrilateral web means;

said third and fourth web means being positioned between said first and second quadrilateral web means and being folded along fold lines positioned between said fifth and sixth and said eighth and ninth margins, respectively, said seventh and tenths margins each forming first and second sections folded over and extending along each other and along said one of said first and second margins of said first and second quadrilateral web means;

first seam means for connecting one of said first and second margins of said first and second quadrilateral web means to each other and to said first and second sections of said seventh and tenth margins of said third and fourth web means;

second seam means for connecting the other of said first and second margins of said first and second quadrilateral web means to each other;

at least third seam means extending along a line intersecting said first and second margins of one of said first and second quadrilateral web means for forming a substantially enclosed chamber;

and means for inflating said chamber and located in one of said first and second seam means.

4,944,530

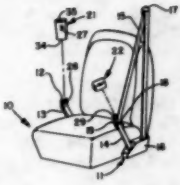
VEHICLE SEAT BELT METAL BUCKLE TEMPERATURE INSULATING COVER

Kevin H. Spurrier, 2205 Ridgecrest Dr., Richardson, Tex. 75080

Filed Mar. 27, 1989, Ser. No. 328,680

Int. Cl.[5] A44B *11/00*; B60R *22/00*

U.S. Cl. 280—801 **13 Claims**



1. A vehicle passenger protective belt metal connector temperature insulative cover comprising: a multi-layer folded over and stitched cover sized and configured to cover a first belt metal connector with first opening means in said cover for connection of a section of said belt to said metal connector; and second opening means in said cover for connection of said metal connector to a second connector on a second section of said belt; wherein said multi-layer material folded over and stitched cover is a three layer material cover with an outside layer a tightly woven resiliently stretchable cloth, an intermediate layer of foamed plastic, and an inner layer of tightly woven material.

4,944,531

DEVICE FOR COUPLING A BRACKET WHICH IS PROVIDED WITH A BUCKLE OF A SEAT BELT, TO A RETAINING MEMBER, WHICH IS FIXED IN A VEHICLE

Walter Knabel, Murnau-Staffelsee; Josef Mayer, Weichs, and Stephan Wentker, Dachau, all of Fed. Rep. of Germany, assignors to Autoliv-Kolb, GmbH. & Co., Dachau, Fed. Rep. of Germany

Continuation of Ser. No. 221,273, Jul. 19, 1988, abandoned. This application Dec. 8, 1989, Ser. No. 449,077

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1987, 3724134

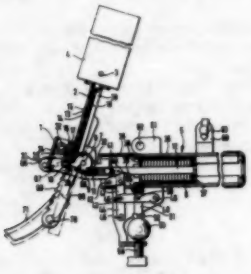
Int. Cl.[5] B60R *22/18, 22/30*

U.S. Cl. 280—806 **10 Claims**

1. A seat belt locking assembly for directly coupling a seat belt buckle to a vehicle in the event of a sudden acceleration or deceleration caused, for example, by a sudden impact, said device comprising:

a pivotable locking member which is directly coupled to the belt buckle and having teeth means; and

a tie rod which is coupled directly to the vehicle but in close proximity to said locking member and generally restrained from moving away from said teeth means of said locking member, said tie rod having receiving means for lockably engaging said teeth means of said locking,



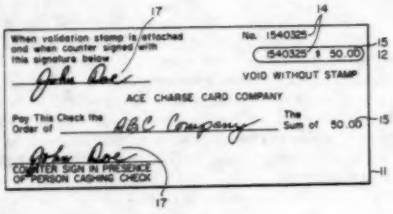
said locking member and said tie rod being positioned relative to each other such that when a tensile force of at least a predetermined amount is exerted on the belt buckle, the locking member is caused to rotate towards said tie rod and said teeth means become lockably engaged with said receiving means to create a direct mechanical coupling between the belt buckle and the vehicle.

4,944,532

MULTIPLE-PART TRAVELERS' CHECK PROVIDING ENHANCED SECURITY AND PREVENTION OF UNAUTHORIZED USE

Albert C. Pollard, Pollard Properties, Inc., P.O. Box 266, Irvington, Va. 22480

Filed May 22, 1989, Ser. No. 354,565
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—70 **4 Claims**



1. A travelers' check system, comprising:

a plurality of travelers' checks, each having a predetermined monetary value printed thereon, said plurality of travelers' checks having a series of serial numbers printed on respective ones thereof so as to define a range, said serial numbers in said series being different from each other said travelers' checks each having a first space for a signature, and a second space for a countersignature;

a record sheet containing a plurality of validation labels, each of said labels having a different respective serial number printed thereon in correspondence with a respective one of said travelers' checks, each of said validation labels further having a predetermined monetary value printed thereon corresponding to a value of said respective one of said travelers' checks;

wherein said travelers' checks are negotiable only when they are combined with the validation label with the same serial number; and

an acknowledgement document containing the smallest and the largest of said serial numbers so as to define said range, wherein, in the execution of said travelers' checks system, said acknowledgement document and said validation labels are transmitted separately to a user.

4,944,533

FORGING-BY-COPYING-PROOF PRINTS

Shohei Tsuchiya, Tokyo, Japan, assignor to Hosokawa Printing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 897,373, Aug. 18, 1986, Pat. No. 4,780,397. This application Oct. 18, 1988, Ser. No. 262,500
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—93 **6 Claims**

1. A process for preparing a forging-by-copying-proof print comprising the steps of first preparing a film positive sheet for a forging-by-copying-proof print, the preparing of the film positive sheet including the steps of providing a latent image negative, placing a multi-line negative on the upper surface of said latent image negative, placing an unexposed film having a photosensitive membrane on the undersurface thereof on the upper surface of said multi-line negative to form a primary three-layer film structure, striking light from a light source against the undersurface of said primary three-layer film structure to partially expose said unexposed film so as to provide a primary film positive sheet, replacing said latent image negative by a latent image positive and said multi-line negative by a mesh negative, respectively, to form a secondary three-layer film structure, striking light from said light source against the undersurface of said secondary three-layer film structure to completely expose said partially exposed film and removing said latent image positive and mesh negative from said secondary three-layer film structure to thereby provide a film positive sheet for a forging-by-copying-proof print for use in the following step, and then preparing a forging-by-copying-proof print from the film positive sheet by an offset or relief printing method.

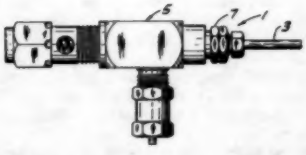
2. A forging-by-copying-proof print prepared by the process as set forth in claim 1.

4,944,534

FRANGIBLE MALE COUPLING COMPONENT

Jeffrey M. Kotyk, St. Louis, Mo., assignor to McNeil (Ohio) Corporation, St. Paul, Minn.

Filed Oct. 3, 1988, Ser. No. 252,770
Int. Cl.[5] F16L *19/00*
U.S. Cl. 285—4 **8 Claims**



1. A frangible male coupling component for sealingly coupling a conduit to a fluid delivery device, such as a lubricant

injector, of the type having a female coupling component with an axial passage therethrough, an internal camming surface in the passage, and internal threads spaced axially outwardly from said camming surface, said male coupling component having an integral tubular body of one-piece construction adapted to coaxially receive the conduit to be coupled, said body comprising:

an axial inner ferrule portion engageable with said camming surface, said ferrule portion having a bore therethrough;

an axial outer screw portion having a bore therethrough generally coaxial with the bore through said ferrule portion, a head formed for engagement by a wrench or the like, and a shank extending axially inwardly from the head formed with external threads engageable with the internal threads of the female coupling component whereby rotation of the screw portion in a first direction is adapted to effect relative axial movement of the male coupling component and the female coupling component to bring said ferrule portion into engagement with said camming surface; and

an annular frangible portion integrally connecting said ferrule and screw portions, said frangible portion having a bore therethrough generally coaxial with the bores through said ferrule and screw portions, said frangible portion being adapted to break on rotation of the screw portion in said first direction when the ferrule portion is in engagement with said camming surface thereby to permit relative rotation between said screw and ferrule portions, continued rotation of the screw portion in said first direction being adapted to effect relative axial movement of the screw portion relative to the ferrule portion to a point where said screw portion is engageable with the ferrule portion to press the ferrule portion against said internal camming surface therebY to cause said ferrule portion to deform radially inwardly against the conduit to form a seal around the conduit to prevent leakage therepast;

said frangible portion being so configured as to break into separate parts attached to the screw and ferrule portions, said parts being engageable with one another to inhibit separation of the screw and ferrule portions in the event the screw portion is rotated in a second direction opposite from said first direction to remove the male coupling component from the female coupling component.

4,944,535

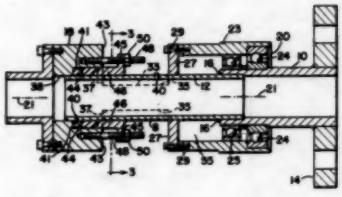
ROTARY LIQUID CONNECTION MECHANISM

Lorne D. Maupin, 341 Wagner Dr., Claremont, Calif. 91711

Filed Oct. 21, 1988, Ser. No. 260,496

Int. Cl.[5] F16L *55/00*

U.S. Cl. 285—16 **15 Claims**



1. A rotary liquid conduit mechanism comprising:

a stationary annular housing structure,

a rotatable fluid conduit extending axially through the housing structure,

bearing means in the housing structure and rotatably supporting the conduit against radial movement relative to said housing structure,

a stationary sleeve structure spaced axially from the housing structure and encircling the conduit,

bridge means extending between the housing structure and the sleeve structure,

said bridge means defining at least one opening for manual access therethrough,

said sleeve structure having an annular packing in a recess therein and disposed about the rotatable fluid conduit,

an annular piston slidable on the rotatable conduit and extensible into the recess to engage the packing, and

means for urging the piston against the packing in the recess to apply axial force to compress the packing.

4,944,536

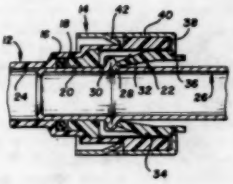
BLEED-DOWN CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 776,644, Sep. 16, 1985, Pat. No. 4,681,351, which is a continuation-in-part of Ser. No. 360,201, Mar. 22, 1982, Pat. No. 4,601,497, which is a continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Mar. 23, 1989, Ser. No. 327,797

Int. Cl.[5] F16L *37/00*

U.S. Cl. 285—319 **13 Claims**



1. A connector assembly for providing a bleed-down connector position with a tubular conduit which is adapted to convey a pressurized fluid, comprising:

housing means for receiving said conduit, said housing means including a ramp means for enabling axial positioning of a cap means, said ramp means being circumferentially positioned about said housing and including varying axial lengths;

sealing means for providing a fluid tight connection between confronting portions of said housing means and said conduit when said conduit is in a fully inserted position in said housing means;

retainer means for maintaining said conduit in said housing means; and

said cap means rotatably mounted on said housing means for controlling the axial position of said retainer means in cooperation with ramp means, catch means associated with said cap means for engaging said ramp means and limiting the axial movement of said cap means with respect to said housing means, said cap means is capable of sliding axially with respect to said housing means upon the rotation of said cap means such that said conduit is permitted to be partially withdrawn from said housing means with the rotation of cap means to said bleed-down connector position in which said sealing means fluid tight connection is interrupted and means for locking said cap means to said housing means to prevent disengagement of said cap means from said housing means.

4,944,537

SMALL-DIAMETER PIPE CONNECTOR

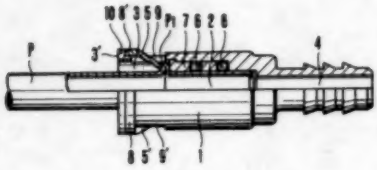
Masayoshi Usui, Numazu, and Katsushi Washizu, Shizuoko, both of Japan, assignors to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Jun. 7, 1989, Ser. No. 362,565

Claims priority, application Japan, Jun. 13, 1988, 63-78170; Sep. 7, 1988, 63-117436

Int. Cl.[5] F16L *39/00*

U.S. Cl. 285—319 11 Claims



1. A connector for connecting a small-diameter pipe, said pipe having opposed first and second ends and an expanded annular wall portion spaced from the first end, said connector comprising:

a connector body having opposed front and rear ends, a channel extending axially into the body from the front end, a small-diameter chamber disposed rearwardly of and in communication with the channel and being provided with a seal ring and a bush therein, said seal ring and said bush being generally annular and having central openings dimensioned to receive the first end of the pipe and to prevent passage of the expanded annular wall portion of the pipe therethrough, a large-diameter chamber disposed rearwardly of and in communication with the small-diameter chamber, the large-diameter chamber being dimensioned to receive the expanded annular wall portion of the pipe therein, the rear end of the body defining a continuous annular support wall having an outer peripheral surface, a plurality of axially-elongate holes disposed forwardly of the continuous annular support wall of the body and extending into the large-diameter chamber; and

a socket body having an annular rear end wall and a plurality of obliquely-projecting pawl walls extending forwardly from the rear end wall of the socket body and inwardly through the axially-elongate holes in the connector body and into the large-diameter chamber, said socket body including an inner peripheral surface, at least a portion of the inner peripheral surface of the socket body engaging at least a portion of the outer peripheral surface of the connector body, wherein the pawl walls of the socket member resiliently lock the pipe in the connector body.

4,944,538

THREADED PIPE JOINT HAVING IMPROVED SEAL RING ENTRAPMENT

Shannon R. Read, Houston, Tex., assignor to Baroid Technology, Inc., Houston, Tex.

Filed Mar. 8, 1989, Ser. No. 320,476

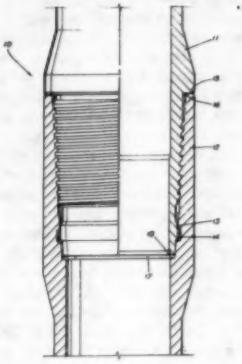
Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—334 4 Claims

1. A threaded, sealed joint comprising:

(a) a box member having a first inwardly tapered threaded section on its inner periphery, an enlarged diameter seal ring groove below the lower end of said first inwardly tapered threaded section, a deformable seal ring in said seal ring groove, and a first smooth, inwardly tapered surface on said inner periphery below said seal ring groove; and

(b) a pin member having a second inwardly tapered threaded section on its outer periphery, an extrusion hump having a given diameter below the lower end of said second threaded section, said pin member having an area between the lower end of said second threaded section and the extrusion hump of a diameter less than the said given diameter of said extrusion hump and a second smooth, inwardly tapered surface on said outer periphery below and immediately adjacent to said extrusion hump having



its greatest diameter less than the said given diameter of said extrusion hump, whereby upon makeup of the joint, the said extrusion hump entraps the said seal ring into sealing engagement between the box member and the pin member, and a primary metal-to-metal seal is formed between said first and second inwardly tapered smooth surfaces.

4,944,539

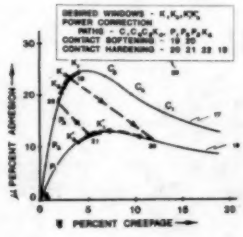
DIFFERENTIAL CREEPAGE CONTROL SYSTEM FOR OPTIMIZING ADHESION OF LOCOMOTIVES

Sudhir Kumar; Shiv R. Kumar, both of Westmont, and Dean A. Becker, Countryside, all of Ill., assignors to Tranergy Corporation and General Motors Corporation, both of Westmont, Ill.

Filed Mar. 15, 1989, Ser. No. 324,258

Int. Cl.[5] B61C *15/08*

U.S. Cl. 291—2 12 Claims


DESIRED WINDOWS - K1,K2,KX
POWER CORRECTION
RATIO - C1,C2,CX = P1,P2,PX
CONTACT SOFTENING - 18 20
CONTACT HARDENING - 20 21 22 19
% PERCENT ADHESION
% PERCENT CREEPAGE

1. A method of controlling power applied to a locomotive drive train, comprising steps of:

(a) determining current I_N drawn by each drive motor of the locomotive;

(b) determining rotation speed n of each drive motor of the locomotive;

(c) calculating a function of differential of motor current with respect to rotational speed for each motor; and

(d) adjusting the power applied to the locomotive drive train in response to said calculated function such that the small-

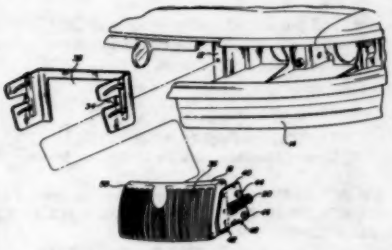
est value of the function calculated for all motors is within an optimum range defined as an adhesion window.

4,944,540

SLIDING RADIATOR GRILL

Dhafer Y. Mansoor, West Bloomfield, and Arnold O. Pohto, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 24, 1989, Ser. No. 356,082
Int. Cl.[5] B60R *19/02*
U.S. Cl. 293—115 **16 Claims**



1. In a motor vehicle having a bumper assembly movable longitudinally of the body of the vehicle between a frontwardly located assembled position and a rearwardly located impact position in response to the imposition of an impact load on the bumper, and a movable grill assembly mounted on the vehicle body rearwardly adjacent and in the path of movement of the bumper assembly, an improved mounting arrangement for the movable grill assembly comprising:

a bracket adapted to be fixedly secured to the vehicle body;

means defining a longitudinally extending pin and slot connection between the grill and the bracket to permit controlled movement of the grill between the assembled and impact positions; and

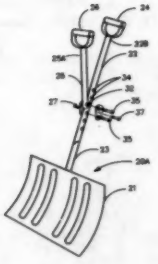
spring means operatively engaged between the grill and the bracket to urge the grill toward the assembled position.

4,944,541

TWO-HANDLED SHOVEL

Kenneth P. Waldschmidt, 309 E. 14th, Ellis, Kans. 67637

Filed Oct. 20, 1988, Ser. No. 260,533
Int. Cl.[5] A01B *1/22*; B25G *3/38*
U.S. Cl. 294—58 **1 Claim**



1. A shovel for use by a shoveler to shovel material, comprising:

an extended main shaft having top and bottom ends, a longitudinal axis extending between said top and bottom ends and apertures spaced along said main shaft, said apertures extending through said main shaft perpendicular to said longitudinal axis;

a main hand grip secured to said top end of said main shaft;

a shovel blade fastened to said bottom end of said main shaft;

an auxiliary shaft having top and bottom ends, said auxiliary shaft having an aperture formed near said bottom end thereof;

a second hand grip securely attached to said top end of said auxiliary shaft;

a brace adjustably and pivotally connecting said bottom end of said auxiliary shaft to said main shaft at a point on said main shaft above the point at which said shovel blade is fastened to said main shaft, said brace including first and second members, each of said members having first and second ends and having first and second apertures formed near said respective first and second ends, said members being in spaced relation to each other with said main shaft in between so that each of said first apertures in said member is aligned with one of said spaced apertures in said main shaft;

first means extending through said first apertures of said members and through said one of said spaced apertures in said main shaft for securing said members to said main shaft;

second means extending through said second apertures in said members and through said aperture in said auxiliary shaft for pivotally securing said auxiliary shaft to said main shaft;

each of said members has a third aperture formed therein spaced from said first aperture therein; and

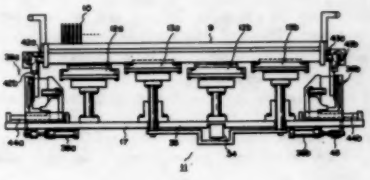
third means extending through said third apertures and through another of said apertures in said main shaft for securing said brace on said main shaft at a fixed angle.

4,944,542

SUPPORT DEVICE

Mizuki Uchida, and Kozo Hara, both of Yamanashi, Japan, assignors to Tel Yamanashi Limited, Nirasaki, Japan

Filed Oct. 6, 1988, Ser. No. 254,183
Claims priority, application Japan, Oct. 7, 1987, 62-253226
Int. Cl.[5] B65G *47/00*; B66C *1/42*
U.S. Cl. 294—86.4 **12 Claims**



1. A support device comprising:

plural mounts on which an object to be supported is mounted,

a means for lifting at least one of said mounts,

a pair of support systems opposed to each other and having a variable interval between them,

drive means for moving said support systems to have a predetermined interval between them,

a single contact arranged at one of the support systems to contact one end face of said object,

a plurality of contacts arranged at the other of said support systems to contact the other end face of said object; and

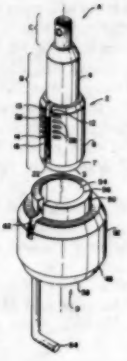
expansible means for compensating for a distance moved by said support systems in synchronization with an abutment of said single contact and said plurality of contacts against the end faces of said object.

4,944,543

ICE AUGER EXTRACTOR FOR RETRIEVING AUGERS OR SIMILAR DEVICES FROM A BORE HOLE

Michael R. Walsh, Weathersfield, Vt., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1988, Ser. No. 172,890
Int. Cl.[5] E21B *31/12*
U.S. Cl. 294—86.29 **5 Claims**



1. A device for retrieving an auger rod from a hole, comprising:

(a) a housing having a longitudinal axis;

(b) said housing including a first bore extending along said longitudinal axis;

(c) said housing having an exterior surface and an interior surface;

(d) said housing having a first recess formed in a portion thereof;

(e) a portion of said first recess extending through said exterior surface to said interior surface;

(f) detent means, including a cam means and a spring means biased thereto, positioned in said first recess for securing an auger rod in said housing;

(g) adapter means releasably attached to said housing for centering the auger rod on said axis, said adapter means including a sleeve having a first end and a second end, said sleeve having a second coaxial bore extending along the longitudinal axis thereof;

(h) said sleeve having a second recess adjacent said first end thereof; and

(i) said second recess aligned with said first recess so that a portion of said cam means extends through said second recess.

4,944,544

VEHICLE ACCESSORY STORAGE DEVICE

Scott W. Dick, 524 Chatham Park Dr., Apt. 2A, Pittsburgh, Pa. 15220

Filed Jun. 23, 1989, Ser. No. 370,180
Int. Cl.[5] B60R *5/04*
U.S. Cl. 296—37.1 **11 Claims**

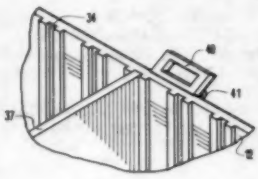
1. A vehicle accessory storage device adapted for securement in a vehicle trunk, comprising:

an elongated open top rectangular receptacle;

an extensible rod mounted at each of two opposite exterior end walls of said receptacle for engagement with opposite interior side walls of a vehicle trunk;

a dovetail groove extending vertically along each of said end walls of said receptacle;

a complementary formed clamp nut slidably received in each of said grooves; and



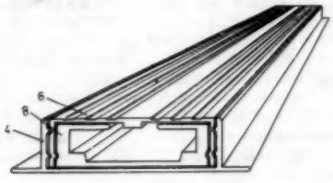
an inner end portion of said rods in threaded engagement with said clamp nuts to allow selective vertical adjustment of said rods along said grooves.

4,944,545

STANCHION FOR GOODS VEHICLES

Sture B. R. Simme, Maratongatan 39, Lidköping, Sweden S-531 52

PCT No. PCT/SE88/00210, § 371 Date Oct. 13, 1989, § 102(e) Date Oct. 13, 1989, PCT Pub. No. WO88/09282, PCT Pub. Date Dec. 1, 1988
PCT Filed Apr. 26, 1988, Ser. No. 424,210
Claims priority, application Sweden, May 19, 1987, 8702069
Int. Cl.[5] B62D *33/023*
U.S. Cl. 296—43 **6 Claims**



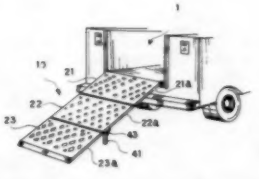
6. A stanchion for retaining goods on a platform of a vehicle formed of at least two shaped aluminum sections interlocked longitudinally by a plurality of mating weight-bearing means including ridges and grooves along two opposed sides of a substantially rectangular configuration to form a unitary load bearing unit surrounding a hollow interior.

4,944,546

FOLDABLE TRUCK RAMP

William K. Keller, P.O. Box 881595, Steamboat Plaza, Colo. 80488

Filed Sep. 8, 1989, Ser. No. 404,883
Int. Cl.[5] B60P *1/43*; B65G *69/28*
U.S. Cl. 296—61 **7 Claims**



1. A folding ramp for vehicles including:

a first plate having a top and bottom pivotably attached to a vehicle;

a second plate having a top and bottom pivotably attached to said first plate;

a third plate having a top and bottom pivotably attached to said second plate;

a plurality of legs pivotably attached to and extending away from said bottom of said second plate;

said legs biased by springs to extend out from said bottom of said second plate;

cable means connecting each leg to one end of a pivoting means; and

said one end of said pivoting means slidably engaged to said bottom of said second plate, said pivoting means having an opposite end pivotably attached to said bottom of said first plate;

whereby unfolding of said first and second plates extends said legs, and folding together said first and second plates causes said legs to retract.

4,944,547

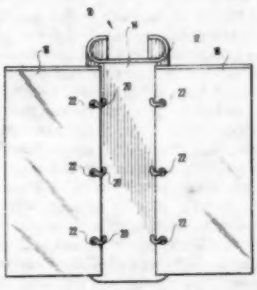
ADJUSTABLE SUN VISOR

Marcella Watts, 724 S. Grand St., and Johnnie M. Wrice, 605 Gail St., both of Charleston, Mo. 63834

Filed Jan. 4, 1989, Ser. No. 293,426

Int. Cl.[5] B60J *3/02*

U.S. Cl. 296—97.8 **9 Claims**



1. An adjustable sun visor for attachment to a generally vertical roof pillar disposed between a windshield and a door window of a vehicle, comprising:

an elongated clamp body formed from a resilient material and having a C-shaped tubular cross section , said clamp body having a planar front surface with opposite longitudinal edges connecting juxtaposed arcuate side walls, said clamp body dimensioned for frictional engagement around a vehicle roof pillar;

a plurality of pairs of rings secured in aligned relation along opposite longitudinal edges of said front surface of said clamp body, forming two parallel aligned ring columns;

a pair of sun shield members;

each of said sun shield members having a plurality of spaced apertures receiving one of said rings, such that said sun shield members are pivotally mounted adjacent said opposite longitudinal edges of said front surface of said clamp body;

each of said sun shield members including a plurality of slidably connected extensible sections; and

said extensible sections connected in overlying parallel relation by cooperating dovetail projections and recesses, whereby said sun shield members may be independently pivotally and slidably adjusted to simultaneously shield a windshield and a door window of a vehicle.

4,944,548

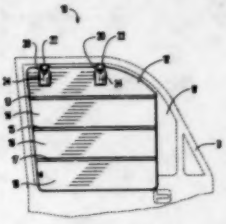
SIDE WINDOW SHADE FOR AUTOMOBILES

George E. Payne, and Doris P. Payne, both of 1121 Prescott, Memphis, Tenn. 38111

Filed Aug. 21, 1989, Ser. No. 396,062

Int. Cl.[5] B60J *3/00*

U.S. Cl. 296—97.8 **1 Claim**



1. A side window shade for automobiles, comprising:

a panel having a plurality of sections connected by double folding joints;

an upper edge of said panel configured with a curvature corresponding to an automobile side window frame;

a plurality of spaced notches in said upper edge of said panel;

a suction cup retainer received in each of said notches for securing said panel to an automobile side window, said suction cup retainer including a pair of pivotally connected jaw members;

spring means biasing said jaw members to a closed position;

aligned clamping portions of said jaw members provided with abrasive friction enhancing pads for engagement with said panel;

a circular aperture formed in one of said jaw members, said circular aperture connected to a side edge of said jaw member by a lateral slot;

a suction cup having a cylindrical reduced diameter neck portion removably received in said circular aperture of said jaw member for engagement with an automobile side window; and

a tab extending upwardly at an oblique angle from a frusto conical back surface of said suction cup for manually releasing said suction cup from an automobile side window.

4,944,549

SUN VISOR FOR MOTOR VEHICLES

Bernhard Hilbert, Cappel, and Gerard Hilt, Henriville, both of France, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Aug. 18, 1989, Ser. No. 395,756

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833673

Int. Cl.[5] B60J *3/02*

U.S. Cl. 296—97.9 **13 Claims**

1. A sun visor for a motor vehicle, said sun visor comprising:

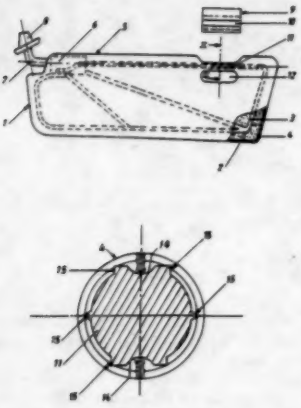
a cushioning body, a reinforcement insert for reinforcing said cushioning body and a cover for covering said cushioning body and said reinforcement insert;

said reinforcement insert including a swing mounting pin, said swing mounting pin being located near an upper edge of said sun visor;

said cover surrounding said swing mounting pin without being welded to said swing mounting pin, said cover including two sheets which are connected together by welds, said welds being formed by high frequency welding, said welds including a first elongated weld which extends along one side of said swing mounting pin and a second elongated weld which extends along another side of said swing mounting pin, said first elongated weld

including an elongated bead which is directed inwardly toward said swing mounting pin;

said swing mounting pin including first means for (a) receiving said elongated bead of said first elongated weld such



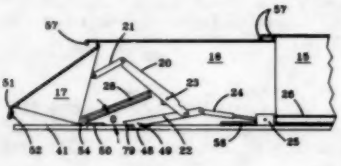
that the outer surface of said cover has a generally smooth, circular cross section in the vicinity of said first elongated weld and (b) preventing relative movement between said cover and said swing mounting pin.

4,944,550

TELESCOPING TYPE COVER FOR TRUCK BEDS AND THE LIKE

Donald L. Drown; Richard O. Runge, both of Galion, and Elmer L. Brumenshenkel, Lexington, all of Ohio, assignors to Versa Cap, Inc., Galion, Ohio

Filed Nov. 29, 1988, Ser. No. 277,250
Int. Cl.[5] B60P 3/32, 7/02
U.S. Cl. 296—100 **22 Claims**



1. An enclosure assembly for an area comprising:

track means having a channel formed therein positioned at spaced apart parallel boundaries of said area and extending the length thereof;

a plurality of rigid cover sections including at least forwardmost and rearwardmost sections extending between said track means and at least one of said cover sections having interengaging means corresponding to said channels for slidable reception in said track means;

said cover sections being extendable to substantially enclose said area and collapsible so as to leave said area at least partially open;

said forwardmost cover section being interconnected to said rearwardmost cover section by actuation means which operates to move at least one of said cover sections to collapsed or extended positions and allows selective positioning of at least one of said cover sections at any variable location between extended and collapsed positions;

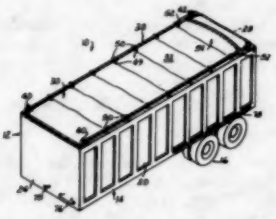
wherein said actuation means includes force applying means coupled to said rearwardmost cover section acting to pivot said rearwardmost cover section into a collapsed position within an adjacent one of said cover sections.

4,944,551

OPEN TOP DUMP TRAILER TARPING SYSTEM

Harold Hardy, Jr., Canton, Mich., assignor to Rock-Way, Inc., Romulus, Mich.

Filed May 30, 1989, Ser. No. 358,078
Int. Cl.[5] B60P 7/04
U.S. Cl. 296—100 **3 Claims**



1. A tarping system for a truck or trailer vehicle body having laterally spaced side walls, longitudinally spaced end walls and an open top, comprising a linear member secured to and extending along the top of each side wall, a flexible tarp for covering the open top of said vehicle body, said tarp having side edge portions provided at longitudinally spaced points with attaching means slidably engaging said linear members, said tarp having a fixed end portion secured to one end wall of said vehicle body, said tarp having as free end portion which may be manually drawn toward the opposite end wall of said vehicle body to cause said attaching means to slide along said linear members and said tarp to assume an extended position covering the open top of said vehicle body, said free end portion of said tarp being capable of being manually drawn toward said one end wall of said vehicle body to cause said attaching means to slide along said linear members and said tarp to fold and bunch up adjacent said one end wall of said vehicle body in retracted position, means for securing said tarp in said extended and retracted positions, a transverse draw bar secured to said tarp adjacent the free end portion thereof, means at the ends of said draw bar slidably engaging said linear members, said free end portion of said tarp extending beyond said draw bar and being in the form of a terminal flap, said terminal flap having a tip end remote from said draw bar and having laterally spaced side edges, and flexible wire-like elements secured to said draw bar near the ends thereof, said wire-like elements extending from said draw bar along and secured to said side edges, said wire-like elements extending to said tip end of said terminal flap where said wire-like elements are connected and adapted to be engaged by said means for securing said tarp in extended and retracted positions.

4,944,552

STOWABLE TABLE SYSTEM

David S. Harris, Denton, Tex., assignor to Weber Aircraft, Inc., Burbank, Calif.

Filed Mar. 17, 1989, Ser. No. 324,617
Int. Cl.[5] A47C 7/70
U.S. Cl. 297—145 **15 Claims**

1. A stowable table system adapted for use in a vehicle seat or the like, including:

a table structure;

means forming a compartment in said seat for stowing said table structure;

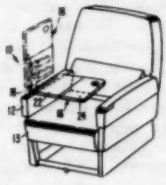
a pivot block mounted for pivotal movement about a substantially horizontal axis in said compartment for moving

said table structure between a stowed condition in said compartment and an exposed condition exteriorly thereof;

a table base for securing said table structure to said pivot block; and

means for attaching said table base for pivotal movement with respect to said pivot block comprising:

a pivot stud having means at one end for pivotal connection with said table base and means at the other end for pivotal



connection to said pivot block, whereby said table base is movable with respect to said pivot block about two angularly spaced pivot axes when said table structure is in its exposed condition; and

mutually cooperable shoulder means fixedly positioned with respect to said pivot block and said table base, respectively, for limiting the angular displacement of said table base with respect to said pivot block when said table structure is in its exposed condition.

4,944,553

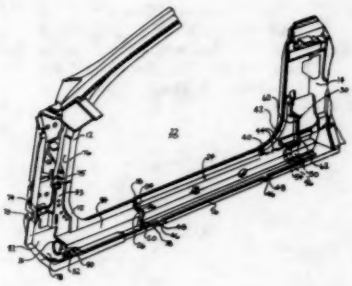
VEHICLE REINFORCING STRUCTURE

Edward H. Medley, Fraser; Raymond N. Kreucher, Jr., Sterling Heights; Dennis F. Stedman, Ortonville, and Thomas R. Downs, Clarkston, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 30, 1989, Ser. No. 373,437

Int. Cl.[5] B62D *27/02*

U.S. Cl. 296—188 **17 Claims**



1. A reinforcement structure for a vehicle having first and second upwardly extending columns longitudinally spaced from each other and a longitudinally extending beam between the first and second columns, said reinforcement structure comprising:

means comprising an elongated tubular member forming a longitudinally extending member adapted to be disposed adjacent the beam; and

means for securing said member to the beam and the first and second columns to absorb and dampen bending and torsional loads between the first and second columns and the beam, said means for securing comprising a support member for sandwiching said tubular member between the beam and said support member, a brace assembly for securing the ends of said tubular member to the first and second columns, and fastening means for fastening means for fastening said support member to said tubular member and beam and said brace assembly to said first and second columns and said tubular member.

4,944,554

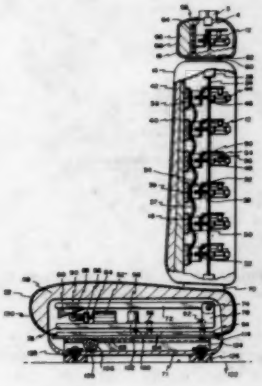
ACTIVE BIOMECHANICAL CHAIR

Clifford M. Gross, 1675 Northern Blvd., Roslyn, N.Y. 11756, and James P. Santos, 223 Rockingstone Ave., Larchmont, N.Y. 10538

Continuation of Ser. No. 103,739, Oct. 2, 1987, abandoned. This application Jul. 12, 1989, Ser. No. 377,804

Int. Cl.[5] A47C *1/022*; B60N *1/02*

U.S. Cl. 297—284 **13 Claims**



1. The combination, comprising:

an active biomechanical chair comprising: a frame structure; a back rest mounted to the frame structure, said back rest including a front wall having an inner surface and an outer surface; a plurality of contour adjusting mechanisms which are spaced apart vertically relative to the front wall, each contour adjusting mechanism having plate means which are horizontally adjustable to engage the inner surface of the front wall, motor means connected to the plate means; seat means connected to the frame structure; a decoder; and a central controller; and

a portable device having a prerecorded particular spinal profile or portion thereof, of an occupant of the chair encoded thereon, said spinal profile, or portion thereof, representing a condition of least intradiscal pressure of an occupant of the chair, said portable device engaging said chair to be read by said decoder and to activate said central controller for controlling the plurality of contour adjusting mechanisms by selectively actuating the individual motor means thereby adjusting the horizontal position of their associated plate means automatically as a function of the prerecorded particular spinal profile or portion thereof so that the outer surface of the front wall automatically conforms to the prerecorded particular spinal profile or portion thereof.

4,944,555

VEHICLE POWER SEAT

Enzo Brusasco, Torino, Italy, assignor to R.G.B. S.p.A., Italy

Filed Jul. 22, 1988, Ser. No. 223,542

Claims priority, application Italy, Jul. 29, 1987, 53564/87 [U]

Int. Cl.[5] A47C *1/02*

U.S. Cl. 297—330 **7 Claims**

1. A vehicle power seat comprising:

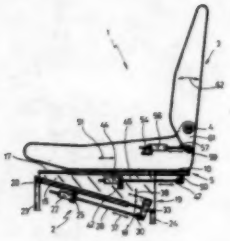
a reclinable backrest and a front seat portion, said seat portion comprising a carriage having an unobstructed center

cavity and connected at the rear to said backrest so as to enable rotation of the same, in relation to said carriage, about a transverse hinge axis;

two fixed longitudinal guides extending perpendicularly to the hinge axis, sloping upwards towards the front of said seat portion, and located on opposite sides of said cavity;

a slide mounted in sliding manner on said fixed guides;

two substantially horizontal longitudinal guides located over the slide and connected in sliding manner to the same, said two horizontal guides supporting the carriage so as to travel, together with the same, along the slide, and being located on opposite sides of said cavity;



a first drive means rigidly fixed with respect to the carriage and connected to rotate the backrest relative to the carriage;

a second drive means rigidly fixed with respect to the slide and connected to move the carriage relative to the slide;

a third drive means rigidly fixed with respect to the fixed guides and connected to move the slide relative to the fixed guides;

and wherein said first, second and third drive means comprise a pair of linear actuators located on opposite sides of said center cavity of the carriage.

4,944,556

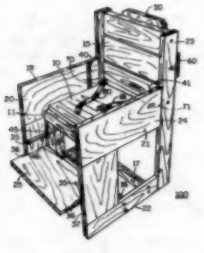
SUPPORTIVE CHAIR, ADJUSTABLE FOR GROWING WITH A CHILD

Theodore J. Griesbaum, Seguin, Tex.; Joan S. Lydic-Mettler, Newark, Del.; Pamela A. Flores, San Antonio, Tex.; Anthony B. Jasek, Eagle River, Ak., and Mary A. Wrzesinski-Conran, San Antonio, Tex., assignors to Brighton School Incorporated, San Antonio, Tex.

Filed Sep. 6, 1988, Ser. No. 240,214

Int. Cl.[5] **A47C** *7/40, 7/50*

U.S. Cl. 297—437 **1 Claim**



1. An apparatus for supporting a person's body in a normal sitting position, comprising:

a seat member for supporting said person, said seat member having a forwardmost edge, a first lateral edge, and a second lateral edge, such that the knees of said person rest beyond said forwardmost edge;

a means for limiting abduction of the legs of said person comprising a first panel connected to said first lateral edge of said seat and a second panel connected to said second lateral edge such that the forwardmost edge of the seat is rearward of the forward edges of the first and second panels said first panel having a first slot and said second panel having a second slot , said slots extending upwardly from a rear portion of said seat member ;

a backrest for holding the back of said person in a substantially upright position, said backrest being selectively positionable in either a first configuration or a second configuration relative to said seat member, said backrest comprising a first member and a second member, said first member rigidly connected between said first and second panels and rearwardly of said opposing slots said second member adjustable relative to said seat member, said second member received slidably in said first slot and said second slot to define said second configuration;

a handle mounted to and extending between the first and second panels and to the rear of said backrest, said handle forming a third slot between said backrest and said handle for receiving said second member therein when said backrest is positioned in said first configuration; and

a footrest for limiting movement of the lower portions of the legs of said person, said footrest being connected between the first and second panels by a further plurality of opposed slots, said further plurality of opposed slots being vertically spaced so in such a manner as to enable the adjustment of the height of said footrest relative to the height of said forwardmost edge of said seat member.

4,944,557

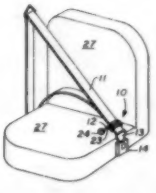
SEAT BELT HANDLE ASSEMBLY

Ryozo Tsubai, 3637 W. Alabama, #155, Houston, Tex. 77027

Filed May 27, 1988, Ser. No. 199,806

Int. Cl.[5] **B60R** *21/00*

U.S. Cl. 297—468 **3 Claims**



1. In combination with a seat and shoulder belt for occupant restraint in a vehicle, a seat belt handle apparatus comprising

clip means for attaching the handle assembly to the shoulder belt,

a handle for grapsing the seat belt handle assembly,

connecting means comprising a flexibly rigid material detachable attaching the handle to the clip means,

the seat belt handle assembly being so attached to the shoulder belt that the handle projects forward parallel to the direction of the occupant when the seat belt is disengaged and the seat and shoulder belt is retracted, and wherein the distance between the said handle and the said clip means may be adjusted by varying the length of the said connecting means.

4,944,558

DRUM CUTTER-LOADER FOR UNDERGROUND MINING

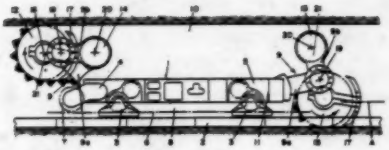
Klaus Oberste-Beulmann, Sprockhovel, and Herbert Schupphaus, Bochum, both of Fed. Rep. of Germany, assignors to Gebr. Eickoff Maschinenfabrik u. Eisengiesserie mbH, Bochum, Fed. Rep. of Germany

Filed Jun. 16, 1989, Ser. No. 367,045

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1988, 3822875

Int. Cl.[5] F21C *25/08*

U.S. Cl. 299—42 20 Claims



1. A drum cutter-loader mining machine comprising:

a machine body;

at least one support arm pivotally mounted to one end of said machine body and supporting a first rotatable cutting drum thereon, said at least one support arm comprising a first arm section pivotally mounted at one end thereof to said machine body and a second arm section pivotally mounted to said first arm section at an end of said first arm section opposite to said one end; and

motor means carried by said second arm section for driving said first cutting drum.

4,944,559

TOOL FOR A MINE WORKING MACHINE COMPRISING A DIAMOND-CHARGED ABRASIVE COMPONENT

Jean Sionnet, Saint Egreve, and Paul A. Renard, Uriage, both of France, assignors to Societe Industrielle de Combustible Nucleaire, Annecy, France

Filed Jun. 1, 1989, Ser. No. 360,175

Claims priority, application France, Jun. 2, 1988, 88 07371

Int. Cl.[5] E21C *35/18*

U.S. Cl. 299—86 15 Claims

1. A tool for a mine working machine comprising:

a single piece steel component body comprising a rear part for enabling said rear part to be mounted into a tool support of the working machine and a front working part provided with a housing and limited by an external working surface of overall frustoconical shape surrounding the housing and correspondirg substantially to an equilibrium erosion profile of the tool in its working conditions, the external working surfacing being at least partially covered with an erosion layer of a material whose hardness is greater than that of the steel forming the body; and

a composite abrasive component directly fixed in the housing of the steel body, said composite abrasive component consisting of a metallic carbide slug integrally bonded to a polycrystal diamond active part having one end thereof projecting from the body.

4,944,560

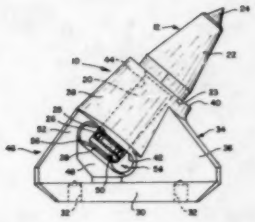
MINER CUTTING BIT HOLDING APPARATUS

George A. Osterwise, Franklin, Pa., assignor to Joy Technologies Inc., Pittsburgh, Pa.

Filed Jun. 15, 1989, Ser. No. 366,559

Int. Cl.[5] E21B *35/18*

U.S. Cl. 299—91 8 Claims



1. Apparatus for attaching a cutting bit, which includes an elongated shank having a cutting tip secured to one end thereof and an abutment surface provided on the other end thereof, to a driven element so that said cutting bit is advanced in a cutting direction, comprising:

a. a base member adapted for attachment to said driven element;

b. a body member attached to said base member on the end thereof facing in the cutting direction, said body member having a first surface on the end thereof facing toward said cutting direction and a second surface on the opposite end thereof and a bore through said body member terminating in apertures in said first and said second surfaces and adapted to receive said shank to hold said cutting bit in a predetermined cutting orientation;

c. a rearward member attached to said base member on the end thereof facing away from said cutting direction, said rearward member having an anvil surface parallel to said abutment surface and disposed in spaced facing relation to said second surface;

d. a reinforcement member attached intermediate and permanently to said rearward member and said body member; and

e. means for releasably retaining said shank in said bore.

4,944,561

PROCESS AND APPARATUS FOR PRODUCING BUNCHES OF ARTIFICIAL OR NATURAL BRUSH MATERIAL

Werner Blankschein, Grandlstrasse 59a, 8000 München 60, Fed. Rep. of Germany

Continuation of Ser. No. 47,631, May 7, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 304,880

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3616976

Int. Cl.[5] A46D *1/10*

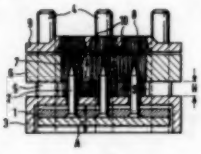
U.S. Cl. 300—10 18 Claims

1. Apparatus for producing brush heads from a brush material consisting of brush material elements having tips and root

ends, which brush material is brought together to form a bundle, each said brush head having a root end, said apparatus comprising:

a brush material holder having a bottom portion and a side wall portion, said bottom and side wall portions defining a bundle receiving aperture in said holder, said aperture extending completely through said side wall portion and having an axis extending substantially perpendicularly with respect to said bottom portion, said bottom portion supporting the tips of the brush material elements in said bundle and said side wall portion being of sufficient height above said bottom portion so that the brush material elements are held in the bundle and prevented from falling apart;

an apertured plate capable of being moved towards said holder along said axis, said apertured plate having a plurality of apertures which receive the root ends of respective portions of said bundle of brush material thereby



dividing the brush material into a plurality of bunches to form respective brush heads and thereby forming and holding the root ends of said brush heads; and

a plurality of support needles having tips projecting into said bundle receiving aperture from the bottom portion substantially in parallel with said axis of said bundle receiving aperture, such that said tips of said support needles remain within said aperture so that after insertion of said bundle of brush material into said bundle receiving aperture,

said support needles project lengthwise into the tips of the bundle of brush material in the direction towards the root ends thereof, and laterally displace the brush material elements and press the brush material elements against one another to eliminate spaces therebetween, thereby permitting improved introduction and uniform distribution of the brush material elements through each aperture of said apertured plate when said apertured plate is positioned against said root ends of the brush material of the bundle.

4,944,562

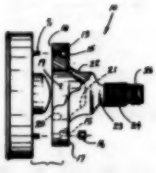
WIRE WHEEL HUB ADAPTER APPARATUS

Britt Garrison, P.O. Box 177, 818 Rose Ave., Morton, Pa. 19070

Filed Feb. 16, 1989, Ser. No. 310,931

Int. Cl.[5] B60B 27/06

U.S. Cl. 301—111 **1 Claim**



1. A wheel hub adapter apparatus for use in combination with a wheel wherein said wheel includes an internally splined hub mounted coaxially of the wheel and a separate internally threaded locking hub, said apparatus comprising,

an annular flange means formed with a circular pattern of apertures for receiving threaded projecting studs extending outwardly from a brake assembly, and

a central hub integrally formed to said annular flange formed with an internal cavity for receiving a bearing cup extending outwardly from said brake assembly, and

an axle means extending outwardly and orthogonally relative to the central hub including a first and second shaft portion to receive said hub and locking hub respectively thereon, and

wherein said annular flange means includes a planar outer surface parallel to a planar inner surface, and said apertures each include a blind bore extending from said outer surface towards an inner surface of a diameter greater than said apertures for accommodating locking nuts therewithin, and

wherein said annular flange means, said central hub, and said axle means are in coaxial alignment with one another, and

wherein said central hub includes a cylindrical wall and a generally hemispherical recess overlying said cylindrical wall for receiving said bearing cup, and

wherein said central hub is formed with a gradually increasing wall thickness extending from said annular flange to said axle means to enhance the strength and rigidity of the apparatus, and

wherein said axle means includes an axle shaft of a first diameter adjacent said central hub and integrally formed to said first shaft portion, said first shaft portion formed of a second diameter greater than said first diameter including circumferentially encompassing splines about said first shaft portion wherein said splines are formed with a forward beveled edge to enhance accommodation of the medial hub, and

wherein said second shaft portion is coaxially aligned with said first shaft portion and integrally formed thereto including external threads for receiving said locking hub wherein said threads extend from said first shaft portion to a forwardmost terminal end of said second shaft portion.

4,944,563

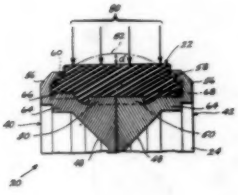
WHEEL ASSEMBLY INCLUDING A SOLID TIRE

Colin Pinchbeck, Kirkland, and Thomas H. Shorey, Mill Creek, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 30, 1989, Ser. No. 331,903

Int. Cl.[5] B60C 7/00

U.S. Cl. 301—63 DS **20 Claims**



7. A wheel assembly having a controlled range of radial deflection under load and resistance to abrasion, comprising:

a solid tire having a cross-sectional shape defined by an outwardly curving surface adjoining two sides, and a radially inner surface, said solid tire comprising a wear-resistant composition of predefined elasticity and shore hardness; and

rim means for mounting the solid tire on an axle, including gripping means for gripping the sides of the solid tire to prevent its circumferential slippage under traction, and means that include a plurality of depressions disposed between the solid tire and rim means, for controlling displacement of the solid tire as it deflects radially under a

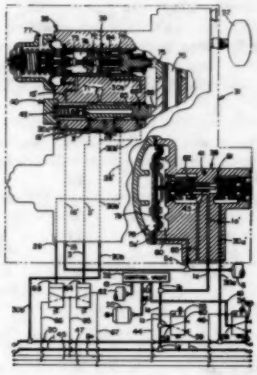
load so that the radial deflection of the solid tire as a function of the load is within predefined limits.

4,944,564

BRAKE VALVE DEVICE ARRANGED FOR ELECTRO-PNEUMATIC CONTROL

Richard F. Balukin, Pittsburgh; John R. Reiss, North Versailles, and Frank J. Jerina, Irwin, all of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed May 26, 1989, Ser. No. 357,567
Int. Cl.[5] B60T *15/54*
U.S. Cl. 303—33 **9 Claims**



1. A brake valve device for charging a brake pipe to a certain chosen pressure and for venting said brake pipe, such charging and venting of said brake pipe effecting operation of a control valve device to admit fluid under pressure to a brake cylinder device and to release fluid under pressure from said brake cylinder device, such release of fluid under pressure from said brake cylinder device being controlled via electro-pneumatic means in series with said control valve device, said brake valve device comprising:

(a) means for selecting different operating conditions of said brake valve device including a Release condition and a Holding condition;

(b) a first passageway having discrete pressure states;

(c) suppression valve means operative for effecting one discrete pressure state of said first passageway in said Release condition of said brake valve device and for effecting another discrete pressure state in said Holding condition of said brake valve device; and

(d) first pressure switch means operative in response to said other pressure state of said first passageway for effecting operation of said electro-pneumatic means such as to cut off said release of fluid under pressure from said brake cylinder device.

4,944,565

HYDRAULIC BRAKE CIRCUIT FOR A MOTOR VEHICLE EQUIPPED WITH WHEEL ANTI-LOCK AND ANTI-SLIP DEVICES

Kervagoret Gilbert, Argenteuil, France, assignor to Bendix France, Drancy, France

Filed May 22, 1989, Ser. No. 355,527
Claims priority, application France, Jun. 15, 1988, 88 07996
Int. Cl.[5] B60T *8/32, 8/48, 13/14*
U.S. Cl. 303—110 **5 Claims**

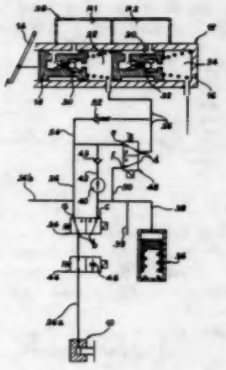
1. A hydraulic brake circuit for motor vehicle equipped with a wheel anti-lock device and with a wheel anti-slip device, the circuit comprising:

a master cylinder controlled by means of a brake pedal,

at least one brake associated with a wheel of the vehicle,

a solenoid relief valve via which the master cylinder normally communicates with the brake, an actuation of said solenoid relief valve controlled by the anti-lock device putting the brake in communication with brake-fluid storage means,

a pump of which an actuation controlled by the anti-lock device delivers brake fluid from the storage means to the



brake via the solenoid relief valve when said solenoid relief valve is not actuated,

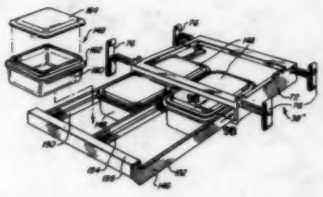
a solenoid anti-slip valve which is located upstream of said solenoid relief valve and via which the master cylinder normally communicates with the brake, wherein an actuation of the solenoid anti-slip valve controlled by the anti-slip device putts the master cylinder in communication with a suction port of the pump, the actuation of which is likewise controlled by the anti-slip device.

4,944,566

REFRIGERATOR SHELF ACCESSORY MOUNTING SYSTEM

Dwight A. Carper, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 9, 1989, Ser. No. 294,370
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—311 **14 Claims**



1. A universal refrigeration apparatus accessory storage system adaptable for mounting to a refrigeration apparatus shelf of any selected width comprising:

a storage accessory for storing items to be refrigerated, said storage accessory including a frame defining opposite sides, each said side having an outwardly opening slot; and

means for attaching said storage accessory to said shelf comprising a pair of brackets, each bracket having a base portion adapted to be slidably received in one of said slots and adjustably positioned relative to said storage acces-

sory according to the selected width of the shelf, and a connector portion for attaching said bracket to the shelf.

4,944,567

FIBER OPTIC LASER BEAM DELIVERY SYSTEM

Jerry W. Kuper, Martinsville; Joseph J. Barrett, Morris Plains; William E. Langert; Martin C. Baker, both of Budd Lake, all of N.J., and Andrew N. Stephenson, Ventura, Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 117,766, Nov. 5, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 294,317

Int. Cl.[5] G02B *6/32*

U.S. Cl. 350—96.18 **12 Claims**

1. An optical fiber means for delivering a high power laser beam, said optical fiber means comprising an optical fiber having and input end for receiving a collimated laser beam, and an output end for delivering the laser beam, wherein said input end incorporates an integrally formed cladded tapered fiber section, said cladded input section having a taper angle not greater than a taper angle θ_c, measured with reference to the center line of the tapered section, is determined by the relationship

$$\theta_c = \sin^{-1}\left(\frac{\eta_{cladding}}{\eta_{core}}\right),$$

wherein η_{core} and $\eta_{cladding}$ represent the refractive indices of the core material and the cladding material, respectively.

4,944,568

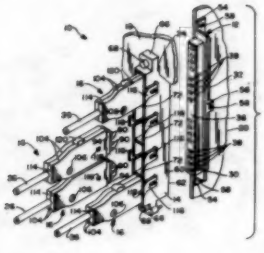
FIBER OPTIC CONNECTOR ASSEMBLY

Philip J. Danbach, Naperville, and Stephen Sampson, Downers Grove, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 5, 1989, Ser. No. 384,203

Int. Cl.[5] G02B *6/36;* **H01R** *13/64;* **H01J** *5/16*

U.S. Cl. 350—96.20 **16 Claims**



1. A fiber optic connector assembly for interconnecting a plurality of active optical devices to a plurality of optical fibers each terminated in a ferrule having a nose portion, said assembly comprising:

a receptacle including a body member for supporting the plurality of active optical devices, said body member having a flat, planar mating face and a plurality of recesses each extending between said mating face and one of the active optical devices;

connector means including housing means with a plurality of ferrule receiving cavities and including a mating end;

means for supporting one of the ferrules in each of said cavities with the nose portion projecting from said mating end;

said housing means being supported adjacent said receptacle body with each of said nose portions received in one of said recesses;

the assebmly being characterized by:

said connector means including at least two similar separately mateable connector modules, said housing means including a corresponding number of at least two module housings each including a plurality of said ferrule receiving cavities;

a shroud interposed between said receptacle and said connector modules, said shroud including a peripheral wall extending between an open receptacle end and an open connector module end, said receptacle end being configured to receive said mating face within said peripheral wall; and

said connector modules being receivable in said connector module end of said shroud for independent compliance of each connector module with a different portion of said receptacle.

12. In a fiber optic connector assembly for use with an optic fiber and an active optical device, the combination comprising:

a conductive metal receptacle body supporting the active optical device;

a connector housing movable to a mated position with a forward end adjacent said receptacle body and including wall means defining a l cavity;

a conductive metal spring retention clip engageable with said wall means adjacent a rear end of said cavity;

a conductive metal ferrule surrounding the end of the optic fiber, said ferrule being received in said cavity and including a nose portion projecting from said forward end of said connector housing; and

a conductive metal spring in said cavity in contact with and in compression between said ferrule and said spring retention clip, said spring urging said ferrule nose portion into contact with said receptacle body and completing a continuous electrical circuit between said receptacle body and said spring retention clip.

4,944,569

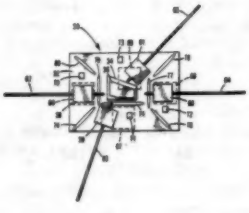
MULTI-FIBER ALIGNMENT PACKAGE FOR OPTOELECTRONIC COMPONENTS

Robert A. Boudreau, Hampton, N.H., and Joanne S. LaCourse, Hudson, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 18, 1989, Ser. No. 395,931

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.20 **17 Claims**



1. A multi-fiber alignment package for optoelectronic components, comprising:

a carrier of a thermally conductive material, said carrier having two opposed major surfaces;

at least one optoelectronic component mounted on a first major surface of said carrier;

a plurality of fiber-positioning means on said first major surface of said carrier, each holding one of said optical fibers coupled to said component;

a plurality of cooling means secured to the second major surface of said carrier, each of said cooling means having a major surface positioned below one of said fiber-positioning means and each being capable of locally controlling the temperature of said carrier in its immediate vicinity; such that each one of said optical fibers may be actively aligned with said component and secured in said aligned position with solder sequentially;

said cooling means serving to locally cool said carrier under said fiber-positioning means during soldering of the fiber-positioning means above it; such that said local cooling causes the heat of said soldering to be conducted away from said carrier at the connection point, thus enabling the sequential soldering of each of said fiber-positioning mean without affecting a previously soldered connection point.

4,944,570

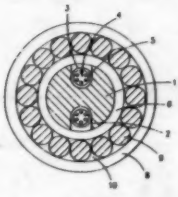
FIBER OPTIC CABLE HAVING AN EXTENDED ELONGATION WINDOW

Michael L. Oglesby, Kansas City, Mo., and Kenneth E. Cornelison, Overland Park, Kans., assignors to Alcatel NA, Inc., Hickory, N.C.

Continuation of Ser. No. 16,103, Feb. 18, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 361,823

Int. Cl.[5] G02B *6/44*

U.S. Cl. 350—96.23 **35 Claims**



1. A fiber optic cable suitable for use as an overhead static wire, comprising:

an electrically conducting core having at least one helical channel with a predetermined lay in its periphery;

a tube containing a dielectric water-blocking compound and at least one optical fiber randomly arranged within the tube, the tube being positioned within said helical channel, and the tube, the optical fiber and the helical channel being arranged to provide an elongation window greater than 0.5%; and

a plurality of metal wires wrapped around and in electrical contact with the core, and providing at least the major portion of the tensile strength for the cable.

4,944,571

OPTICAL FIBERS

Alan J. Rogers, Bookham, England, assignor to National Research Development Corporation, London, England

Filed Sep. 17, 1987, Ser. No. 97,826

Claims priority, application United Kingdom, Sep. 19, 1986, 8622609

Int. Cl.[5] G02B *6/02, 6/16*

U.S. Cl. 350—96.29 **6 Claims**

1. A spatially-distributed optical-fibre measurement system including a length of monomode 'D' fibre having a flat surface coated with a material which has an optical refractive index strongly dependent on the temperature, a continuous-wave linearly polarised radiation source adapted to launch radiation at one end of the fibre, an acoustic driver adapted to launch an acoustic pulse to induce local circular (optical) birefringence

within said fibre and a modulation detector adapted to measure the modulation of the emergent light.

4,944,572

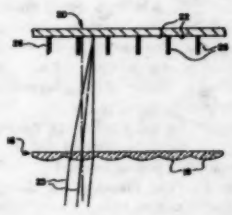
VARIABLE ASPECT DISPLAY

Clinton J. T. Young, c/o Outlook Engineering Corporation, P.O. Box 2185, Alexandria, Va. 22301

Continuation-in-part of Ser. No. 47,829, May 6, 1987, abandoned, which is a division of Ser. No. 766,379, Aug. 16, 1985, Pat. No. 4,663,871, which is a division of Ser. No. 457,607, Nov. 13, 1983, Pat. No. 4,542,958. This application Aug. 24, 1988, Ser. No. 236,101

Int. Cl.[5] G09F *19/14;* G03B *25/02*

U.S. Cl. 350—167 **4 Claims**



1. A variable aspect display, comprising:

a lenticular screen having a series of discrete lens elements;

a non-planar object field supported behind said lenticular screen at or near the foci of said lens elements;

said object field being divided into a plurality of lens fields, each of said lens fields corresponding to one of said lens elements and extending across substantially the entire intended viewing angle for its respective one of said lens elements for the intended range of viewing directions for said variable aspect display;

said lens fields each being divided into a plurality of display elements to form a pattern, said display elements selectively visible to a viewer through said lenticular screen as a function of the angular position of the viewer in relation thereto; and

said object field including means for extending each of said lens fields, along at least one edge thereof, toward said lenticular screen to shield adjacent ones of said lens fields from being viewed at off-center viewing angles through ones of said lens elements not associated therewith, thereby to continue presenting the proper corresponding ones of said lens fields to the particular individual ones of said lens elements associated therewith when viewed at such off-center viewing angles;

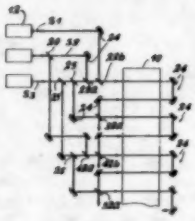
said display elements being positioned along said means for extending said lens fields, whereby at least a portion of each of said patterns extends toward said lenticular screen, thereby positioning said patterns at distances from said lens elements at least partially compensating for the curvature of field of said lens elements at off-center viewing angles.

4,944,573

DEVICE FOR DISTRIBUTING LASER BEAMS USED IN AN ISOTOPIC SEPARATION METHOD

Maurice Michon, Draveil, France, assignor to Commissariat a l'Energie Atomique, France

Filed Feb. 24, 1989, Ser. No. 314,944
Claims priority, application France, Mar. 2, 1988, 88 02634
Int. Cl.[5] G02B 27/14; B01D 59/34
U.S. Cl. 350—173 1 Claim



1. Device for distributing laser beams used in an isotopic separation method by lasers, comprising:

(a) a flow chamber for containing a body from which a substance is to be extracted;

(b) a plurality of laser sources delivering laser pulses of beams S1, . . . , Sn, n being a whole number at least equal to 2, with different wavelengths allowing for a selective excitation of the substance to be extracted and a transformation of said substance after excitation, each wavelength corresponding to a valve of the absorption cross section of the substance to be extracted;

(c) a plurality of partially reflecting mirrors allowing for beams S1, . . . , Sn to be divided into several parts;

(d) means for superimposing beams S1, . . . Sn and introducing them into various places of the chamber; and

(e) a means for returning beams following several passages through the chamber and an adjustment of the path lengths through the chamber, wherein the means for superimposing beams comprise various categories of dichroic mirrors, each category presenting spectral characteristics different from those of the other categories, the partially reflecting mirrors and the dichroic mirrors being selected and disposed so as to optimize the absorption of at least two beams of different wavelengths, regardless of the values of the absorption cross sections corresponding to the wavelengths of these beams.

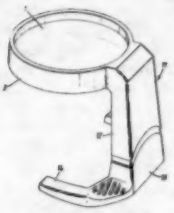
4,944,574

STAND MAGNIFIER AND LENS

Robert J. Roote, High Wycombe; Ian K. Pasco, Warfield; Ian J. Smithers, Taplow, and Paul J. Fisher, Slough, all of England, assignors to Combined Optical Industries Limited, Berkshire, England

Filed Jan. 28, 1988, Ser. No. 149,280
Claims priority, application United Kingdom, Jan. 28, 1987, 8701880
Int. Cl.[5] G02B 25/00, 3/02
U.S. Cl. 350—245 7 Claims

1. A stand magnifier comprising a stand adapted to be supported on a surface, said surface having an object zone to be magnified by said magnifier, a magnifying lens of predetermined focal length fixed to a part of said stand, at least said part of the stand and the lens fixed thereto being tiltable together to a predetermined angular extent with respect to the surface in either direction from a position where the lens is parallel to the surface and about a point separated from the lers by a distance close to the focal length of the lens, whereby the lens is maintained substantially at its optimum working distance from said object zone of the surface, said lens being a bi-convex lens



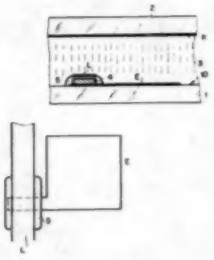
having aspheric surfaces, each of substantially identical curvature.

4,944,575

ELECTROOPTICAL DISPLAY SCREEN AND A METHOD OF FABRICATION OF SAID SCREEN

Pierre Aigrain, Paris; Bruno Mourey, Boulogne-Billancourt; Jean C. Dubois, St. Remy les Chevreuses; Michel Hareng, La Noville, and Philippe Robin, Sceaux, all of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 51,710, May 20, 1987, abandoned. This application Dec. 28, 1988, Ser. No. 291,327
Claims priority, application France, May 20, 1986, 86 0744
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—333 10 Claims



1. An electrooptical display screen comprising:

first and second parallel plates which tightly enclose electrooptical material;

the first plate being provided on that face which is in contact with the electrooptical material with a matrix array of electrodes arranged in rows and columns each electrode forming a pixel of said display, row control leads each associated with one row of electrodes of said matrix array and extending in a direction parallel to each row of electrodes;

the second plate being provided on that face which is in contact with the electrooptical material with column leads each corresponding to one column of the matrix array of electrodes of the face of the first plate so that each electrode is located at an intersection of a row control lead and a column lead; and

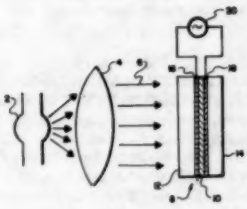
a plurality of coupling elements of ferroelectric polymer material, with one element being placed at the intersection of each electrode and its associated row control lead and lying therebetween so as to electrically couple the electrode and the row control lead, each element being covered with a thin film of insulating material.

4,944,576

FILM WITH PARTIAL PRE-ALIGNMENT OF POLYMER DISPERSED LIQUID CRYSTALS FOR ELECTRO-OPTICAL DEVICES, AND METHOD OF FORMING THE SAME

Anna M. Lacker, Los Angeles; J. David Margerum, Woodland Hills; Elena Ramos, Santa Monica; Willis H. Smith, Jr., Newbury Park, and Khoon C. Lim, Agoura, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 21, 1988, Ser. No. 170,955
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—334 15 Claims



1. A method for forming a polymer dispersed liquid crystal (LC) film, comprising:

forming a solution of a LC dissolved in a polymerizable monomer system,

polymerizing said solution to form a polymerized film having a dispersion of LC bubbles therein,

causing the LC molecules within said bubbles to partially align in a predetermined direction during said polymerization, and

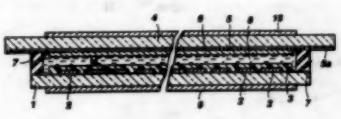
controlling said direction of the LC molecules during polymerization so that substantially less than full alignment in said predetermined direction is achieved, thereby providing the film with a relatively low threshold voltage for optical transmission, and a relatively high optical contrast ratio over a predetermined voltage range.

4,944,577

LIQUID CRYSTAL DISPLAY DEVICE

Tetsushi Yoshida, and Ken Kozima, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 258,176
Claims priority, application Japan, Oct. 19, 1987, 62-263146
Int. Cl.[5] G02F 1/13
U.S. Cl. 350—346 19 Claims



16. A liquid crystal display device, comprising:

opposing first and second substrates;

a plurality of first electrodes substantially parallelly arranged on and extending in a first direction on an inner surface of said first substrate opposing said second substrate;

a plurality of second electrodes substantially parallelly arranged on and extending in a second direction perpendicular to the first extending direction of said first electrodes on an inner surface of said second substrate opposing said first substrate;

a first aligning film, covering surfaces of at least said first electrodes formed on said first substrate, and oriented in a first direction;

a second aligning film, covering surfaces of at least said second electrodes formed on said second substrate, and oriented in a second direction substantially 90° with respect to the first orienting direction of said first aligning film;

a nematic liquid crystal, interposed between said first and second substrates on which said first and second electrodes are formed, and having a positive dielectric anisotropy and a value of a dielectric ratio $\Delta\epsilon/\epsilon\perp$ of not less than 0.1 and not more than 0.5 which is a ratio of a dielectric anisotropy $\Delta\epsilon$ to dielectric constant in a direction perpendicular to a liquid crystal molecular axis direction, a value of an elastic constant ratio K_{33}/K_{11} of not more than 0.8 which is a ratio of a bending elastic constant K_{33} to a splay elastic constant K_{11}, and values of a liquid crystal layer thickness d and an optical anisotropy Δn with which a value of a product Δn-d of the liquid crystal layer thickness d and the optical anisotropy Δn becomes not less than 0.5 (μm) and not more than 0.7 (μm);

a sealing member for sealing said nematic liquid crystal between said pair of substrates; and

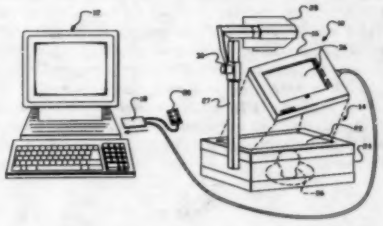
a pair of polarizing plates arranged to sandwich said nematic liquid crystal so that polarizing axis directions of said pair of polarizing plates are parallel to each other.

4,944,578

COLOR GRAPHIC IMAGER UTILIZING A LIQUID CRYSTAL DISPLAY

William W. Denison, Edina, Minn., assignor to Telex Communications, Minneapolis, Minn.

Filed Jul. 21, 1988, Ser. No. 222,164
Int. Cl.[5] G02F 1/13; G03B 21/00
U.S. Cl. 350—347 E 25 Claims



1. A display apparatus comprising: a liquid crystal cell including

(i) a liquid crystal material having a state of optical retardation variable only within a range between about 0.3 microns and 1.6 microns,

(ii) a plurality of electrodes for applying an electric field across said liquid crystal material,

(iii) a first polarizer at a viewing side of said cell

(iv) a second polarizer on the side of said cell remote from said first polarizer, and

(v) said liquid crystal material in said cell responsive to different magnitudes of the electric field for the display of perceived color differences;

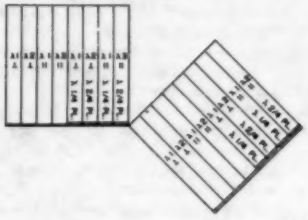
said cell part of a panel positionable on a stage projector, said panel having first and second transparent surfaces to establish a light path therethrough and said cell located therebetween; and

means for interfacing said cell with a computer and for converting color display information produced by said computer to drive signals and means for applying said drive signals to said electrodes wherein different levels of average rms voltage are applied across selected ones of said electrodes to display said perceived color differences.

4,944,579
DETECTION SYSTEM FOR CIRCULARLY POLARIZED RADIATION

Walter G. Egan, Woodhaven, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 31, 1989, Ser. No. 359,371
Int. Cl.[5] G02B 5/30, 5/28
U.S. Cl. 350—396 6 Claims

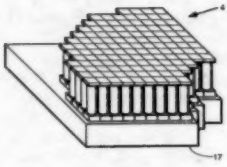


1. A system for detecting polarized radiation having a circular polarization component, comprising a radiation filter which comprises a plurality of different wavelength λ1 to λn interference filter coatings applied to different areas of filter substrate, including at least four coating areas for each wavelength λn, such that different wavelengths λ1 to λn are passed by the different areas of the substrate, and a plurality of different polarization filters of either parallel polarization or perpendicular polarization applied to said different areas of the filter substrate, such that some of the different areas of the filter substrate pass radiation of parallel polarization and others of the different areas pass radiation of perpendicular polarization, and at least first and second quarter wave plates for each different wavelength λn, a first quarter wave plate being applied over a parallel polarization λn coating area, and a second quarter wave plate being applied over a perpendicular polarization λn coating area, and each quarter wave plate being designed particularly for each wavelength λn and applied to both the parallel and perpendicular polarization filters to enable a characterization of the circular polarization component of the radiation.

4,944,580
ACTIVE SEGMENTED MIRROR INCLUDING A PLURALITY OF PIEZOELECTRIC DRIVERS

MacDonald Bruce G.; William G. Hulburd, and Raymond A. LaBelle, all of San Diego, Calif., assignors to Thermo Electron Technologies Corp., San Diego, Calif.

Filed Jul. 27, 1988, Ser. No. 225,092
Int. Cl.[5] G02B 7/18, 5/08; G01V 1/20
U.S. Cl. 350—611 5 Claims



1. A segmented mirror for making wavefront corrections comprising:

a mounting block,

a plurality of piezoelectric drivers, each driver having a generally tubular shape defining an axis, and a first end and a second end and comprising outside and inside electrically conducting surfaces said conducting surface being fabricated to define at least three axial piezoelectric segments each segment having its own independent voltage source, each voltage source having a voltage range including zero volts, so as to provide tilt, tip, and piston piezoelectric motion for said driver,

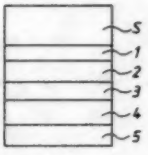
a plurality of segment mirror elements each such mirror element comprised of an essentially flat mirror surface and a mirror substrate,

said plurality of piezoelectric drivers being attached to said mounting block and said plurality of segment mirror elements being attached one each to said plurality of piezoelectric drivers in such a manner as to produce an essentially flat segmented mirror when all of said independent voltages sources are at zero voltage.

4,944,581
REAR FACE REFLECTION MIRROR OF MULTILAYER FILM FOR SYNTHETIC RESIN OPTICAL PARTS

Hajime Ichikawa, Sagamihara, Japan, assignor to Olympus Optical Company Limited, Japan

Filed Aug. 18, 1989, Ser. No. 396,640
Claims priority, application Japan, Sep. 20, 1988, 63-235556
Int. Cl.[5] G02B 5/08, 5/28, 1/00
U.S. Cl. 350—641 4 Claims

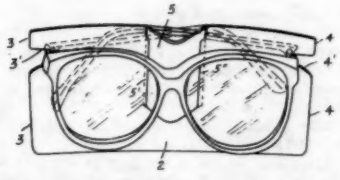


1. A rear face mirror of multilayer film for synthetic resin optical part comprising a synthetic resin substrate and a five layer laminate formed on a surface of said substrate, wherein a first layer viewing from a side of said surface is SiO layer having an optical thickness (n_1d_1) of $0 < n_1d_1 \leqq 0.1\lambda_0$, a second layer is CeO_2 layer having an optical thickness (n_2d_2) of $0.19\lambda_0 \leqq n_2d_2 \leqq 0.25\lambda_0$, a third layer is SiO_2 layer having an optical thickness (n_3d_3) of $0.25\lambda_0 \leqq n_3d_3 \leqq 0.3\lambda_0$, a fourth layer is Al layer having a mechanical thickness (d_4) of 100～200 nm, and a fifth layer is SiO layer having an optical thickness (n_5d_5) of $0.18\lambda_0 \leqq n_5d_5 \leqq 0.25\lambda_0$.

4,944,582
DEVICE FOR SUPPORTING SPECTACLES FRAMES

Alberto Zancaner, Piazza Roma, 8, 31040 Segusino (Treviso), Italy

Filed Feb. 26, 1988, Ser. No. 160,598
Claims priority, application Italy, Mar. 11, 1987, 21087/87[U]
Int. Cl.[5] G02C 1/00; A45C 11/04
U.S. Cl. 351—41 1 Claim



1. A device for supporting a single spectacles frame having two glass loop portions, a bridge portion for joining the two loop portions, and two arms, said device comprising a substantially rectangular flat base element having rounded corners, a top portion, a central recess formed in said top portion, and

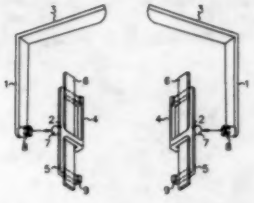
opposite side notches for supporting the two arms in the bent condition of the arms; and a dihedral-shaped spacer element engageable in said central recess for supporting the bridge portion to prevent deformation of the bridge portion, and having a rounded corner portion for engaging the bridge portion, and spaced elongate cuts for removably engaging said flat base element.

4,944,583

EYEGLASS SHADING DEVICE

Matthew G. Jennings, 1820 Monte Vista La., Moses Lake, Wash. 98837

Filed Mar. 15, 1989, Ser. No. 323,801
Int. Cl.[5] G02C *7/16*
U.S. Cl. 351—45 **1 Claim**



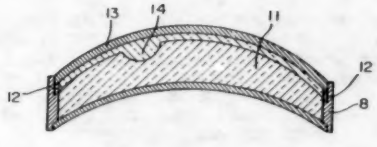
1. A shading device for attachment to a pair of eyeglasses, the device comprising an elongated shading member, a second elongated member extending rearwardly from said shading member, said second elongated member having a receptacle attached to the end distant from said shading member, said receptacle consisting of a plurality of expandable sides, said device further comprising a clip element having a shaped portion with an opening through which the temple of a pair of eyeglasses may pass, and said clip further having a tail section in the form of an L extending from said shaped portion for supporting the clip against the temple, said clip further including a ball element being sized for providing a rotatable connection to the receptacle; whereby, when said device is attached to a pair of eyeglasses, an adjustable eye shade is provided.

4,944,584

PLASTIC MULTIFOCAL POINT SPHERICAL LENS

Koichi Maeda; Akio Takigawa; Yasuyoshi Tago, all of Nishinomiya, and Motoaki Yoshida, Kawanishi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 61,592, Jun. 15, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 315,258
Claims priority, application Japan, Jun. 14, 1986, 61-137295
Int. Cl.[5] G02B *3/10*; B29D *11/00*
U.S. Cl. 351—172 **2 Claims**



1. A plastic multifocal point spherical lens comprising a unitary structure of

(A) a first synthetic resin layer having a fixed refractive index,

(B) a second synthetic resin layer having a substantially fixed refractive index different from the refractive index of the first synthetic resin layer and

(C) a third synthetic resin layer existing between the first synthetic resin layer and the second synthetic resin layer and having a refractive index gradient varying continuously from the refractive index of the first synthetic resin layer to that of the second synthetic resin layer,

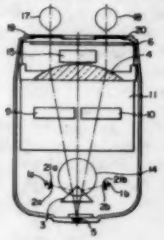
part of the second synthetic resin layer and part of the third synthetic resin layer together being recessed into the first synthetic resin layer, and the second synthetic resin layer being thicker at the recessed part than the rest, said recessed part having either a spherical surface or a parabolic surface.

4,944,585

DEVICE FOR MEASURING PUPILLARY DISTANCE

Toshiaki Mizuno, Gamagori, Japan, assignor to Nidek Co., Ltd., Gamagori, Japan

Filed Dec. 8, 1988, Ser. No. 281,367
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—204 **11 Claims**



1. A device for measuring a pupillary distance comprising:

fixation target forming means disposed in said device and including at least a light source;

a window provided in a front panel of said device in such a manner as to enable a subject to look at a fixation target in the device;

locating means for locating said front panel properly in relation to a face of said subject;

at least a converging lens fixedly mounted in said device such that an appearant viewing distance of said fixation target has a predetermined distance value and said converging lens is disposed corresponding to at least one eye of the subject;

sighting mark forming means provided on an inner side of said front panel such as to form a sighting mark which corresponds to a position of a cornea reflection image of said fixation target formed on a cornea of said subject;

sighting mark position control means for enabling an inspector to control a position of said sighting mark in relation to the position of said cornea reflection image;

observation means for enabling said inspector to observe a front portion of an eye of said subject; sighting mark position reading means for reading a position of said sighting mark at least at a preselected viewing distance;

viewing distance setting means for setting a viewing distance at which said pupillary distance is desired to be determined;

computing means for determining the pupillary distance at the desired viewing distance set by said viewing distance setting means based upon the position of said sighting mark at said preselected viewing distance; and

computing display means for displaying the result of said means.

4,944,586

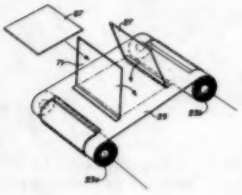
AUTOMATED TRANSPARENCY ORGANIZER

Bruce M. Rightmyre, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1989, Ser. No. 444,000

Int. Cl.[5] G03B *23/10*

U.S. Cl. 353—108 **2 Claims**



1. A conveniently demountable apparatus for use in conjunction with an overhead projector, for storing and automatically displaying overhead transparencies comprising:

a. a web means having at least one transparent section thereon;

b. means for holding at least one overhead transparency on said web means over said transparent section said means for holding comprising corner strip means for securing an overlay leaf;

c. cassette means for positioning said web means in proper alignment over said overhead projector;

d. means for driving said web means and said transparencies mounted thereon in said cassette means over the active projecting area of said overhead projector.

4,944,587

STAR SENSOR

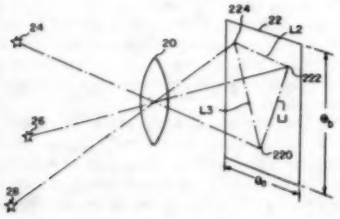
Masatoshi Harigae, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1989, Ser. No. 318,635

Claims priority, application Japan, Mar. 17, 1988, 63-64059; Jan. 17, 1989, 1-5947

Int. Cl.[5] B64G *1/36*

U.S. Cl. 356—152 **6 Claims**



1. A star sensor for attachment to a base, comprising:

imaging means fixed to the base for generating star image signals corresponding to the appearance of a star from the base;

memory means for storing predetermined star information corresponding to an assumed magnitude of brightness and position of the star;

processing means connected to the imaging means for determining actual star information from the star image signals corresponding to the actual magnitude of brightness and position of the star, and generating an attitude signal corresponding substantially to the orientation of the base with respect to the star when the predetermined star information and the actual star information substantially coincide;

detecting means for generating an output signal corresponding substantially to the attitude of the base with respect to a predetermined orientation; and

correcting means responsive to the detecting means for correcting the predetermined star information stored in the memory means when the predetermined star information and the actual star information do not substantially coincide.

4,944,588

SYSTEM FOR DETECTING LASER RADIATION

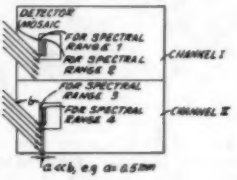
Ludwig Köhler, Walldorf, Fed. Rep. of Germany, assignor to Eltro GmbH, Heidelberg, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,592

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640946

Int. Cl.[5] G01C *1/00*; H01J *3/14*

U.S. Cl. 356—152 **17 Claims**



16. A system for detecting laser radiation, comprising processing electronics coupled to a detection unit arranged on an object to be protected such that detection of laser radiation is possible, said detection unit detecting laser radiation in a sector-shaped solid angle and comprising:

(a) an array of fixed detector elements arranged in a plane, each detector element of said array being capable of generating a signal in response to the impingement of laser radiation in a first predetermined wavelength range thereon; and

(b) a diaphragm for defining the field of vision of said detection unit, the diaphragm having a quadrate window of a size substantially equal to the size of said array and lying in a plane substantially parallel to the plane of said array and displaced therefrom,

wherein said diaphragm and said array are arranged so that a direction of laser radiation passing through said window can be determined by said processing electronics in dependence on the pattern of said detector elements having laser radiation impinging thereon.

4,944,589

METHOD OF REDUCING THE SUSCEPTIBILITY TO INTERFERENCE OF A MEASURING INSTRUMENT

Karl G. Nordqvist, Viken, Sweden, assignor to Tecator AB, Hoganas, Sweden

Filed Sep. 22, 1988, Ser. No. 247,689

Claims priority, application Sweden, Dec. 8, 1987, 8704886

Int. Cl.[5] G01J *3/18, 3/51*; G01N *21/27*

U.S. Cl. 356—326 **4 Claims**

1. A method of reducing the susceptibility to interference of a measured value obtained from a measuring instrument which measured valued has at least one property which varies during measurements an thereby introduces an unknown interference of the measurement value comprising the steps of:

subjecting a test object to measurements with respect to a plurality of primary test object properties whose effect on the measured value concerning a secondary property of

said test object has been mapped by a calibration procedure which is effected by;

taking measurements by means of the same or a similar instrument which measurements are carried out on a sufficient number of calibration test objects each having a known value of the secondary property, and with a sufficient variation of the other test object properties affecting the second property, so as to cover expected variations of said properties, and

by processing mathematically the thus obtained measured values of said primary properties in such manner that a number of calibration constants in a mathematical relationship between said primary properties and said secondary property are generated, and

intentionally introducing during the calibration procedure a variation of at least one property of the measuring instrument, or a representation thereof in the processing of measured values, said variation having the same order of magnitude as or being substantially greater than expected variations, when one or several test objects are being measured, without information on the variation in said at least one property of the measuring instrument being supplied to said instrument in any other way.

4,944,590

OPTICAL-FIBER GYROSCOPE OF SAGNAC TYPE HAVING A FIBER-OPTIC LOOP AND 3×3 COUPLER

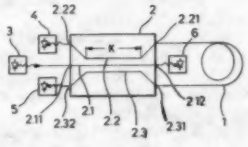
Hans Poisel, Dachau, and Gerd Trommer, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GMBH, Munich, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,720

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 3805904

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—350 **4 Claims**



1. An optical-fiber gyroscope of the Sagnac type having a fiber-optic loop, and a 3×3 coupler comprising three optically coupled fiber-optic guides, the fiber optic guides each having a first end and a second end, a first of said fiber-optic guides of the 3×3 coupler being coupled at the first end to an optical radiation source and the two other fiber-optic guides of the 3×3 coupler being coupled on respective ones of the second ends to ends of the fiber-optic loop and, on the first ends, each to a radiation detecting instrument, the first fiber-optic guide of the 3×3 coupler being coupled to a radiation detecting instrument on the second end opposite the radiation source.

4,944,591

DOUBLE PHASE-CONJUGATE FIBER OPTIC GYROSCOPE

Ian C. McMichael, Port Hueneme, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 5, 1988, Ser. No. 280,088

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—350 **4 Claims**

1. An optical fiber rotation sensor, comprising:

a source of coherent light;

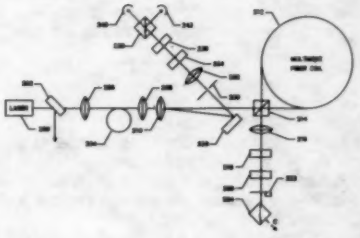
a first polarizing beam splitter for transmitting a first component of the coherent light having a first polarization direction and reflecting a second component of the coherent light having a second polarization direction orthogonal to the first polarization direction;

a coiled multimode optical fiber having first and second ends coupled to the first beam splitter such that the first component is directed into the first end of the fiber and the second component is directed into the second end of the fiber, the first and second components thereby propagating in the fiber in opposite directions;

a polarizer having a third polarization direction at 45° with respect to the first and second polarization directions for receiving the portion of the first component transmitted by the first beam splitter after propagating through the fiber and for receiving the portion of the second component reflected by the first beam splitter after propagating through the fiber, the polarizer thereby transmitting a linearly polarized third component containing equal contributions from the first and second components;

a half-wave plate for receiving the third component from the polarizer and rotating the polarization of the third component by 45°;

a phase conjugating element oriented to receive the polarization-rotated third component and reflect a phase-conjugated fourth component in a direction opposite to the third component by self-pumped phase conjugation,



such that the fourth component retraverses the half-wave plate and the polarizer, then is divided by the first polarizing beam splitter into fifth and sixth components, the first beam splitter transmitting the fifth component with the first polarization direction and reflecting the sixth component with the second polarization direction;

such that the fifth component is directed into the second end of the fiber and the sixth component is directed into the first end of the fiber, the fifth and sixth components thereby propagating in the fiber in opposite directions,

a second polarizing beam splitter for receiving the portion of the fifth component reflected by the first beam splitter after propagating through the fiber and for receiving the portion of the sixth component transmitted by the first beam splitter after propagating through the fiber, the second beam splitter transmitting a seventh component having the first polarization direction and reflecting an eighth component having the second polarization direction;

a first detector for measuring the power of the seventh component; and

a second detector for measuring the power of the eighth component, the difference between the power of the seventh component and the power of the eighth component being related to the angular motion of the rotation sensor.

4,944,592

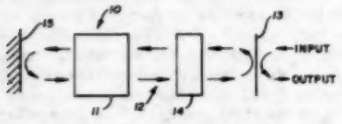
DEVICE AND METHOD FOR QUANTUM NONDEMOLITION MEASUREMENTS USING PARAMETRIC OSCILLATION

Harry J. Kimble, Austin, Tex.; Silvania F. Pereira, Campinas, Brazil, and Daniel F. Walls, Auckland, New Zealand, assignors to The University of Texas System, Austin, Tex.

Continuation of Ser. No. 109,218, Oct. 16, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,869

Int. Cl.[5] G01J 4/00

U.S. Cl. 356—364 7 Claims



1. A device for measurement of a characteristic of an electromagnetic field, comprising:

means for converting at substantially a single frequency between at least a portion of the electromagnetic field in a first polarization state and at least a portion of the electromagnetic field in a second polarization state; and,

means for parametrically amplifying said polarization states having a gain G, said means for parametrically amplifying coupled to said means for converting, the magnitude of converting between said first polarization state and said second polarization state a function of said gain G.

4,944,593

VOLUME-MEASURING METHOD FOR SURFACE DEPRESSIONS

Reiner Kalstroem, Kiel, and Erich Schulz-DuBois, Preetz, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

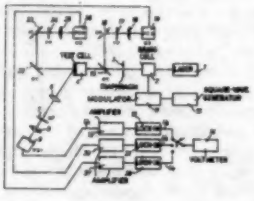
PCT No. PCT/DE87/00239, § 371 Date Dec. 30, 1987, § 102(e) Date Dec. 30, 1987, PCT Pub. No. WO87/07369, PCT Pub. Date Dec. 3, 1987

PCT Filed May 26, 1987, Ser. No. 153,840

Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617714

Int. Cl.[5] G01B 11/06

U.S. Cl. 356—379 12 Claims



1. A method of measuring the volume of surface depressions, comprising the steps of filling the depression to be measured with a material which emits wavelength-shifted scattered light under irradiation; and illuminating said material with a light source which has a wavelength that lies in the region of the absorption spectrum of said material; and measuring the intensity of the wavelength-shifted scattered light which is emitted by the material with a photo-detector, and wherein the measured intensity indicates the volume of the surface depression.

4,944,594

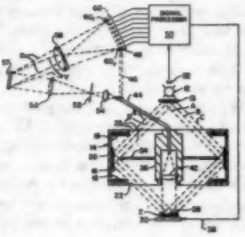
APPARATUS AND METHOD FOR MEASURING DARK AND BRIGHT REFLECTANCES OF SHEET MATERIAL

Gary N. Burk, Columbus, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Apr. 28, 1988, Ser. No. 187,204

Int. Cl.[5] G01J 3/42

U.S. Cl. 356—446 18 Claims



1. Apparatus for measuring dark and bright reflectances of translucent sheet material, comprising:

first optical means for illuminating one side of the sheet material with a source of optical electromagnetic radiation of substantially uniform intensity, whereby a portion of said reduction is transmitted through the sheet material and another portion of said radiation is reflected by the sheet material;

stationary electrically switchable optical gating means, positioned adjacent the other side of the sheet material in a fixed position relative to said first optical means, for absorbing substantially all of the transmitted portion of said radiation when electrically switched to a dark state and reflecting substantially all of the transmitted portion of said radiation back into the sheet material when electrically switched to a bright state;

second optical means for collecting said reflected portion of said radiation and the portion of said transmitted portion of said radiation reflected by said optical gating means and retransmitted through the sheet material to provide a total reflectance having a dark reflectance intensity when said optical gating means is in said dark state and a bright reflectance intensity when said optical gating means is in said bright state; and

sensing means, responsive to said total reflectance provided by said second optical means, for providing a dark signal having a magnitude corresponding to said dark reflectance intensity and a bright signal having a magnitude corresponding to said bright reflectance intensity.

4,944,595

APPARATUS FOR PRODUCING CEMENT BUILDING MATERIAL

Simon Hodson, 3916 State St., Santa Barbara, Calif. 93102

Filed Aug. 19, 1988, Ser. No. 234,819

Int. Cl.[5] B28C 5/16; B01F 5/12, 7/22

U.S. Cl. 366—65 20 Claims

1. In an apparatus for producing cement paste, the apparatus of the type including a hollow generally barrel-shaped enclosure having a bottom and a central longitudinally disposed rotatable shaft and having a feed inlet to receive cement and water and a discharge outlet to dispense the resulting paste, the inner wall of the enclosure including an upper cylindrical portion above and adjacent to a middle conical portion which is above and adjacent to a lower conical portion, the enclosure including a thrust generating assembly having:

a downthrust generating component which includes a substantially horizontal set of upper downthrust blades is spaced relationship relative to each other, and a lower set

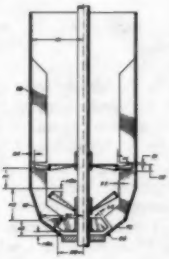
of downthrust blades in a spaced relationship relative to each other, each of such blades having a leading and a trailing edge;

an upthrust generating component which includes substantially horizontal upper upthrust blades in spaced relationship relative to each other, each of the upper upthrust blades having a leading and a trailing edge and being coupled to one of the substantially horizontal upper downthrust blades outwardly of the upper downthrust blades, and substantially vertical lower upthrust blades in spaced relationship relative to each other, each of such lower upthrust blades having a leading edge and a trailing edge; and

upper and lower baffles extending from the inner walls of the enclosure toward the shaft, the upper baffle having a lower end and the lower baffle having an upper end, the lower end of the upper baffle and upper end of the lower baffles being spaced from each other providing a baffle space, the lower baffle having a lower free edge, wherein each of the upper upthrust blades is rotatable within the baffle space,

the improvement wherein,

the ratio of R1 to H1 ranges from 0.39 to 0.45, the ratio of R1 to R2 ranges from 0.80 to 0.83, the ratio of R1 to H2 ranges from 0.59 to 0.61, the ratio of R1 to R3 ranges from 0.36 to 0.41, the ratio of R1 to H3 ranges from 0.30 to 0.32, the ratio of R1 to H2σ ranges from 0.001 to 1.0, the ratio



of R1 to H3σ ranges from 0.001 to 1.0, G1 is 0.20±0.124 inches, G5 is 0.25±0.125 inches, and V ranges from a height of H1+H2+H3 to H1+H2+H3+4R1,

where R1 is the radius of the cylindrical portion of the inner wall of the housing,

R2 is the radius of the cylindrical portion of the inner wall of the housing along the horizontal plane containing the upper edge of the lower upthrust blade,

R3 is the radius of the lower conical portion of the inner wall of the housing along the horizontal plane containing the lower edge of the lower upthrust blade,

H1 is the distance along the shaft between the horizontal plane containing the leading edge of the upper upthrust blade and the horizontal plane containing lower end of the cylindrical portion of the housing,

H2 is the distance along the shaft between the horizontal plane containing lower end of the cylindrical portion of the housing and the lower end of the middle conical portion of the housing,

H3 is the distance along the shaft between the horizontal plane containing the lower end of the middle portion of the housing and the horizontal plane containing the lower end of the lower conical portion of the housing,

H2σ is the smallest vertical distance between the upper edge of the lower downthrust blade and the plane containing the largest radius of the middle conical portion,

H3σ is the smallest vertical distance between the bottom and the lower edge of the lower upthrust blade,

G1 is the smallest distance between the leading edge of the upper upthrust blade and the lower edge of the upper baffle,

G5 is the smallest distance between the trailing edge of the lower upthrust blade and the lower free edge of the opposing lower baffle, and

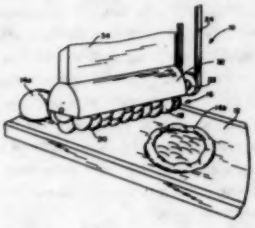
wherein R1 ranges from 4.0 to 48.0 inches.

4,944,596

APPARATUS WITH ROLLER FOR KNEADING A PROOFED BALL OF DOUGH

Eugene L. DeChristopher, 20 Ahlstrom Rd., Cotati, Calif. 94928

Filed Sep. 18, 1989, Ser. No. 408,918
Int. Cl.[5] B29B 1/06
U.S. Cl. 366—69 **5 Claims**



1. A roller for kneading a proofed dough ball into a pizza shell comprising:

a shaft;

an elongated core member, comprising a number of rings keyed onto said shaft side by side, mounted for rotation about a longitudinal axis; and

a plurality of annular rows of spherical protrusions on said core member along the length thereof;

there being a row of spherical protrusions around each of said rings;

the spherical protrusions on each of said rings being staggered relative to the spherical protrusions are closely nested;

at least some of said protrusions being in the configuration of more than one-half of a sphere extending above the surface of said core member;

each of said rings being of a width less than the diameter of said spherical protrusions.

4,944,597

EXTRUSION APPARATUS

Paul Geyer, 15660 Tacoma, Detroit, Mich. 48025

Filed May 4, 1989, Ser. No. 347,092
Int. Cl.[5] B29B 1/06
U.S. Cl. 366—79 **7 Claims**

1. An extrusion apparatus for the refining, mixing and extruding of thermoplastic and rubber like materials, for both hot or cold feed, which comprises:

an elongated generally cylindrical barrel member and an elongated rotor member disposed coaxially in the interior of said barrel member;

means provided for relative rotational movement between said rotor and barrel members in treating and axial advancing the material to be processed along said members;

said rotor and barrel members having a feed end and a dis-

charge end, a pressurizing section, a rotor to barrel transfer zone, a barrel extrusion mixing section, a barrel to rotor transfer zone, and an end extrusion section interposed between said feed and discharge ends;

said pressurizing section being provided with helical rotor grooves coacting with a smooth barrel bore to pressurize and transport the process material to the rotor to barrel transfer zone;

said barrel within said extrusion mixing section being provided with a first longitudinally extending barrel groove;

said barrel to barrel transfer zone having a pair of barrel grooves which start shallow and increase in depth and in extrusion capacity;

said rotor within said rotor to barrel transfer zone being provided with multiple short longitudinal cam-shaped projections arranged to receive the said process material, from the said pressurizing section and forcing it radially outward into said pair of barrel grooves which increase in depth and extrusion capacity, in a circumferential downstream direction and at their downstream end are arranged to transfer the said process material to said longitudinally extending barrel groove extending the length of the barrel extrusion mixing section and having upstream and downstream ends;

said first longitudinally extending barrel groove terminating at the downstream end of the barrel extrusion mixing section in a wide cam-shaped area which starts deep and progressively decreases in depth in a circumferential downstream direction and which coacts with a smooth cylindrical rotor to move said process material in a circumferential direction;

the rotor action developing high local pressure in the process material and as the clearance between the cam-shaped area to rotor decreases, a high shear rate develops forming conditions ideal for the micro dispersion of chemicals into the polymer, and the flow of the said process material is such that the well worked process material is rapidly moved downstream in preference to the less worked process material deeper in the cam-shaped area;

whereby moving the said well worked process material rapidly forward, minimizes the rework of well worked process material and exposes the less worked material to extruder action;

said barrel extrusion mixing section having a second longitudinally extending groove;

the said process material, at the end of the cam-shaped area being intercepted by said second longitudinally extending groove, extending the length of the barrel extrusion mixing section and at its downstream end enters the barrel to rotor transfer zone, the barrel portion of which is provided with dual circumferential grooves, communicating with said second longitudinally extending groove of the barrel extrusion mixing section and directing the process material radially inward to multiple helical rotor grooves, arranged to receive said process material and transport it downstream;

design of said barrel to rotor transfer zone is such, that endwise movement of said rotor member in relation to the barrel member obstructs the barrel to rotor flow of the process material and thereby reduces extruder capacity;

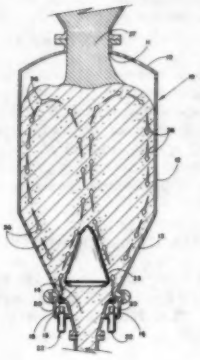
the control of extruder capacity can be used to control the temperature of extrusion as approximately the same input work is applied to less process material.

4,944,598

CONTINUOUS FLOW AIR BLENDER FOR DRY GRANULAR MATERIALS

James R. Steele, Stillwater, Minn., assignor to Dynamic Air Inc., St. Paul, Minn.

Filed May 10, 1989, Ser. No. 349,780
Int. Cl.[5] B01F *13/02*
U.S. Cl. 366—106 **5 Claims**



1. Apparatus for mixing together two or more granular materials, comprising:

(a) a vertically elongated container having an open discharge outlet at the bottom and a vertical center line;

(b) inlet means for simultaneously feeding two or more granular materials into the top of said container so they tend to fall toward the bottom of the container;

(c) means for applying pressurized gas upward and inward toward the vertical center line of the container into the falling granular materials while the granular materials are being fed into the container to cause turbulence within the container to mix the materials together; and

(d) means within the container located above the discharge outlet for deflecting the granular materials from flowing in a direct path from said inlet means to said discharge outlet.

4,944,599

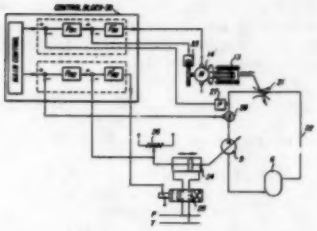
IMPINGEMENT MIXING DEVICE WITH PRESSURE CONTROLLED NOZZLE ADJUSTMENT

Wolfgang Soechtig, Germering, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany

Division of Ser. No. 119,127, Nov. 10, 1987, Pat. No. 4,854,713.
This application Jun. 8, 1989, Ser. No. 363,022
Int. Cl.[5] B01F *15/02*
U.S. Cl. 366—132 **7 Claims**

1. A method for controlling a high pressure impingement mixing device comprising the steps of:

monitoring the pressure of a mixing head component delivery line,



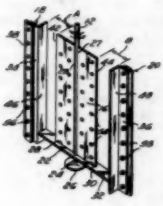
axially displacing a nozzle needle thereby affecting pressure in said component delivery line in a fashion to regulate pressure at desired levels.

4,944,600

METHOD AND APPARATUS FOR LOW FROTH AGITATION OF TANK FLUIDS

John L. McKelvey, Lakeland, Fla., assignor to The Ink Company, Sacramento, Calif.

Division of Ser. No. 212,268, Jun. 27, 1988, Pat. No. 4,893,943.
This application Oct. 31, 1989, Ser. No. 429,714
Int. Cl.[5] B01F *7/16, 15/06, 7/32*
U.S. Cl. 366—142 **15 Claims**



1. A method for agitating and controlling the viscosity of fluid within a holding tank having a generally cylindrical inner tank wall, said method comprising the steps of:

(a) providing and positioning, within said holding tank, a fluid mixing and tank wall wiping device comprising:

(1) a vertical shaft member;

(2) at least one panel joined to and extending laterally from said vertical shaft member, and

(3) at least one tank wiping blade connected to said vertical shaft member and held in contact with the inner wall of the fluid holding tank such that rotational movement of the shaft member will cause said tank wall wiper blade to separate fluid from said inner tank wall;

(b) placing a quantity of a first fluid within said holding tank;

(c) continually sensing the viscosity of the fluid held within said holding tank;

(d) rotating said vertical shaft member in a first rotational mode to maintain temperature homogeneity within said first fluid and maintaining said first rotational mode so long as the viscosity of said fluid remains within a predefined operative range;

(e) upon sensing that the viscosity of the first fluid has moved out of said predefined operative range, adding a second fluid to said first fluid to provide a first fluid/second fluid mixture having a viscosity which is within said predefined range;

(f) coincident with the addition of said second fluid to said first fluid, shifting from said first rotational mode to a second rotational mode whereby said fluid mixing and tank wall wiping device will thoroughly mix and disperse said second fluid within said first fluid to form the said first fluid/second fluid mixture;

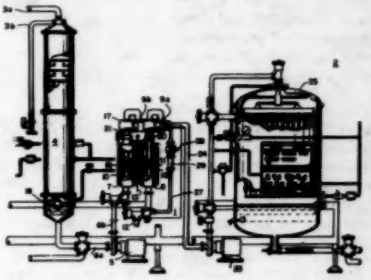
(g) upon sensing that the viscosity of the first fluid/second fluid mixture has entered said predefined range, shifting once again to said first rotational mode;

4,944,601

DAMON SYRUP RECOVERY SYSTEM

Kenneth Damon, R.F.D. #1, Box 610, Poland, Me. 04273

Filed Feb. 8, 1990, Ser. No. 476,712
Int. Cl.[5] B01F *15/02;* **A23L** *2/40*
U.S. Cl. 366—160 **10 Claims**



1. A method for proportionately combining water and a syrup in an automated large-scale bottling system, comprising process (a) and improvement process (b) wherein said process (a) includes the steps of:

a. transferring said syrup from a syrup reservoir and said water from a water reservoir adjacent to said syrup reservoir into a mixing manifold located directly above said syrup reservoir and said water reservoir, utilizing

i. an immersed syrup conduit extending downward from said mixing manifold into, but not to the bottom of, said syrup reservoir and an immersed water conduit extending downward from said mixing manifold into, but not to the bottom of, said water reservoir,

ii. a controllable pressurization of said syrup reservoir and said water reservoir wherein said pressurization forces said syrup up through said immersed syrup conduit into said mixing manifold and also forces said water up through said immersed water conduit into said mixing manifold,

b. mixing said water and said syrup in said mixing manifold to produce a mixture of said syrup and said water in a ratio determined by the size of a syrup orifice fixture in proportion to the size of a water orifice fixture, wherein

i. said syrup orifice fixture connects said mixing manifold and said immersed syrup conduit,

ii. said water orifice fixture connects said mixing manifold and said immersed water conduit,

c. pumping said mixture with a transfer pump through a transfer line to a carbonation vessel, and

d. stopping said process (a) by automatic termination when said syrup in said syrup reservoir falls to the bottom of said immersed syrup wherein a syrup plunger in said immersed syrup conduit and a water plunger in said immersed water conduit are closed simultaneously, leaving a syrup residue in said syrup reservoir,

wherein said improvement process (b) comprises the steps of

a. reopening said water plunger in said immersed conduit to force said water up into said mixing manifold utilizing said controllable pressurization of said water reservoir,

b. creating a venturi effect at a recovery orifice fixture by pumping said water from said mixing manifold through

said transfer line past said recovery orifice fixture, wherein said recovery orifice fixture connects a residue transfer tube with said transfer line,

c. reopening said syrup plunger to force said syrup residue out of said syrup reservoir and up into said transfer line utilizing

i. said residue transfer tube, one end of said residue transfer tube comprising said recovery orifice fixture and the other end comprising a transfer tube orifice fixture, wherein said transfer tube orifice fixture opens into a syrup inlet line underneath said residue in said syrup reservior,

ii. said controllable pressurization of said syrup reservoir,

d. mixing said syrup residue flowing into said transfer line with said water flowing past said recovery orifice fixture so as to form a residue mixture,

e. sizing said recovery orifice so as to ensure that said residue mixture contains said syrup residue and said water in a predetermined proportion,

f. pumping said residue mixture to said carbonation vessel.

4,944,602

HIGH PRESSURE HOMOGENIZING APPARATUS

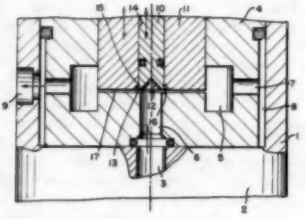
Hanns-Georg Buschelberger, Vaterstetten, Fed. Rep. of Germany, assignor to Bran & Luebbe GmbH, Norderstadt, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,335

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818237

Int. Cl.[5] B01F *5/06*

U.S. Cl. 366—337 **16 Claims**



1. A high pressure homogenizing apparatus for break-up of micro-organisms or other micro-biological structures, comprising a nozzle assembly having an inlet and an outlet, an annular gap communicating with said inlet and said outlet, said gap having a width transverse to a given flow direction, said nozzle assembly including a stationary member and means displaceable relative to said stationary member for adjusting the gap width, a cutting edge provided downstream of said inlet and having a defined circumference in a path of flow, a concentrical annular recess extending around said cutting edge and having a width transverse to said flow direction so as to exceed said gap width downstream of said cutting edge, said recess width decreasing in said flow direction.

4,944,603

RECLOSABLE PACKAGE WITH ENCOMPASSING TAMPER-EVIDENT BAND

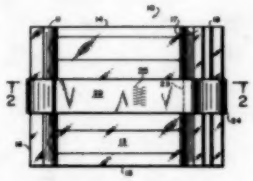
Darrell G. Cornish, McFarland; Timothy G. Mally, Oregon; Daniel A. Thiemann, Windsor, and Bjorn J. Thompson, Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 14, 1989, Ser. No. 338,268

Int. Cl.[5] B65D *33/34*

U.S. Cl. 383—5 **9 Claims**

1. In a flexible package wherein a product is sealed between opposed front and back wall panels, wherein the package is permanently sealed about any bottom and side edges and contains an access opening at a top edge and wherein the access opening contains a reclosure seal, the improvement comprising a tamper-evident band which is permanently bonded to the front and back wall panels and extends across and spans a portion of the access opening spaced from said access opening, such that attempts to remove the band will result in visible disruption of either the band itself or the front or back wall



panel, said reclosure seal is a zipper seal, said band contains at least two lines of perforations which are spaced apart from each other and which define and facilitate removal of said portion of the band which extends across the access opening at the top edge of the flexible package to thereby provide substantially unobstructed digital access to said zipper seal for opening and closing same.

4,944,604

FLEXIBLE CONTAINER COMPRISING SEVERAL LIFTING MEANS

Eirik Myklebust, and Odd F. Rasmussen, both of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

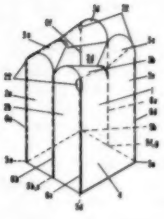
PCT No. PCT/NO88/00028, § 371 Date Dec. 21, 1988, § 102(e) Date Dec. 21, 1988, PCT Pub. No. WO88/08400, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 18, 1988, Ser. No. 288,644

Claims priority, application Norway, Apr. 24, 1987, 871705

Int. Cl.[5] B65D *30/04, 33/02, 33/14*

U.S. Cl. 383—7 **10 Claims**



1. In a flexible intermediate bulk container including a side wall structure formed of at least one piece of flexible woven material, a base structure at the bottom of said side wall structure, and at least two lifting loops formed of integral extensions of upper portions of said side wall structure, said lifting loops having a total combined width equal to at least 25% of the circumference of said side wall structure, the improvement wherein:

said side wall structure includes plural side wall panels;

each said side wall panel includes at least one said integral extension; and

each said lifting loop is formed by folding and joining respective said integral extensions of adjacent said side wall panels at an angle to the principle axis of said lifting loop, such that each said lifting loop is composed of material of said adjacent side wall panels, and opposite edges of each said lifting loop and all fibers of said material therebe-

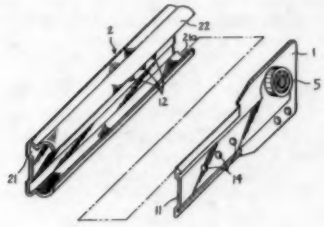
tween have substantially the same lifting height in an unstressed mode.

4,944,605

DRAWER SLIDES SETS

Ming T. Shen, No. 909, Fu Hsin Road, Chupei, Hsinchu, Taiwan

Filed Oct. 2, 1989, Ser. No. 415,632
Int. Cl.[5] A47B 88/00
U.S. Cl. 384—19 4 Claims



1. A drawer slide set comprising:

a guide for connection to the interior of a cabinet, said guide comprising a guide-connector (1) formed of a single plate having an inner portion (11) with upper and lower hook profiles, and an outer portion, a roller (5) rotatably mounted to a side of said outer portion of the single plate forming the guide-connector, a guide-rail (2) formed by a single molded piece of material and having upper and lower curved flanges (22), said guide-rail having a channel (21) therein with a shape confirming to the shape of the inner portion of the guide-connector for receiving the inner portion of the guide-connector therein near an outer end of the guide-rail, said guide including means for fixing said guide-connector to said guide-rail;

a slide adapted for connection to the side of a drawer for sliding engagement on said guide to permit the draw to slide into and out of the cabinet, said slide comprising a slide-connector (3) formed of a single plate having an outer end (31) and upper and lower bent edges (32, 33), said slide-connector having an inner portion and a roller (6) rotatably mounted to a side of said inner portion of said slide-connector, said slide including a slide-rail (4) with an upper arc flange (42) on an upper edge thereof and a V-shaped channel (41) formed under said arc flange near the upper edge of said slide-rail, said slide-rail including an inclined base (43) defining a recess, said outer end with said upper and lower bent edges of said slide-connector conforming in shape to said V-shaped channel and the recess form by said inclined base, said outer end with said upper and lower bent edges of said slide-connector being received within said V-shaped channel and the recess of said inclined base, said slide including means for fixing said slide connector to said slide-rail; and

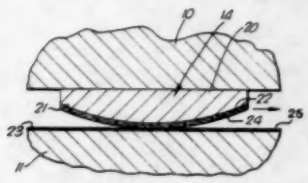
said upper curved flange (22) being larger than said arc flange (42) so that with said slide slidably engaged to said guide, said arc flange is in sliding contact under said curved flange and, with relative movement between said sliding guide, said rollers (5, 6) of said guide-connector and said slide-connector roll respectively on said slide-rail (4) and said guide-rail (2).

4,944,606

PRECISION MOTION SLIDEWAYS

Kevin Lindsey, Middlesex, and Stuart T. Smith, Bedfordshire, both of England, assignors to The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 7, 1989, Ser. No. 405,938
Claims priority, application PCT Int'l Appl., Apr. 16, 1987, PCT/GB88/00296; United Kingdom, Apr. 16, 1987, 8709290
Int. Cl.[5] F16C 33/20, 33/14
U.S. Cl. 384—42 32 Claims



1. A plain bearing slide system including a carriage (10) mounted on a slide (11), the carriage (10) being kenematically constrainable to move along an accurately defined paath by means of bearing pads (14) between the carriage (10) and slide (11), characterised in that the surface of each bearing pad (14) is of convex shape, is coated with a thin layer (22, 41) of sybstantially non-eroding polymeric material having a convex surface (24), and is arranged to ride along a counterface in the form of a surface (25) of a thin layer (23, 42) of substantially non-eroding polymeric material, the combined thickness of the two layers (22, 23, 41, 42) of the substantially non-eroding polymeric material being such that the difference between the static and dynamic coefficients of friction is considerably less than the difference between the static and dynamic bulk coefficients of friction and that the fluctuation in dynamic coefficient of friction is correspondingly reduced.

32. A process of constructing a plain bearing slide system having a carriage (10) mounted on a slide (11), the carriage being kinematically constrainable to move along an accurately defined path by means including bearing pads (14) between the darriage (10) and the slide (11), the system being characterised in having the surface of each pad (14) of convex shape, coated with a thin layer (22,41) of sybstantially non-eroding polymeric material, and arranged to ride along a counterface (25) on a thin layer (23,42) of substantially non-eroding material, the process being characterised in including the steps of;

selecting a polymeric substance which, at the planned operating conditions of the slide system, has a thin layer difference of static and dynamic coefficients of friction substantisily less than the bulk difference and a correspondingly reduced fluctuation in dynamic coefficient of friction, and which is capable of providing a counterface (25) having a roughness no greater than 5 nanometers Ra;

determining a combined thickness of the thin layers (22, 23; 41,42) which gives a reduced difference in coefficient of friction and a reduced fluctuation in dynamic coefficient of friction appropriate to the required accuracy of the instrument;

establishing limits of radius of curvature of a surface (24,44) of the thin layer (22,41) of each bearing pad (14) within which, in use, any variation of interface contact position or area and any inadequacy in averaging out geometrical imperfections are not too great to prevent the required accuracy from being attained, and within which interface stress remains within acceptable limits; and

constructing the bearing pads (14), assembling the carriage (10), slide (11) and bearing pads (14) and adding the layer (23,42) of material to provide the counterface (25) for each bearing pad (14) such that the combined thickness of the thin layers (22, 23; 41, 42) is no greater than that which has

been determined to give coefficient of friction characteristics appropriate to the desired accuracy.

4,944,607

REVOLVING GUIDING MEANS FOR ROLLING MEMBERS

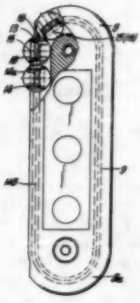
Werner Jacob, Brianring 29, D-6000, Frankfurt/Main 70, Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 378,132

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824191

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—44 21 Claims



1. Revolving guiding means for rolling members, comprising:

a basic member having two extending parallel track portions and two curved deflection portions connecting the two track portions, a first one of the track portions being provided as a supporting track portion from which the rolling members project so as to establish contact with a guiding rail track, a second one of the track portions and the curved deflecting portions being at least partially closed so as to permit load-free guidance, each of the portions having running tracks for the rolling members; and

a plurality of adjoining cage elements (13, 13*a*) each having, relative to adjoining cage elements, faces with cylindrical portions (14, 14*a*) having an axis (15), the cylindrical portions (14, 14*a*) being arranged so that the axis (15) extends perpendicularly to a center plane (ME) through the center (M) of the rolling members (12, 12*a*), each rolling member (12, 12*a*) being guided so as to be laterally embraced by a cage element, the cage elements (13, 13*a*) further having guiding extensions (16, 16*a*) arranged so as to extend vertically to the center plane (ME) so as to engage guiding grooves (17, 17*a*) parallel to a center path (MB) of the rolling members.

4,944,608

ROLLER-TYPE LINEAR GUIDE

Nobuyki Osawa, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 7,174,235, Mar. 28, 1988, abandoned. This application May 26, 1989, Ser. No. 357,116

Int. Cl.[5] F16C *29/04, 29/12*

U.S. Cl. 384—58 3 Claims

1. A roller-type linear guide comprising:

a guide rail having opposed sides with outer surfaces thereon, the rail extending in a longitudinal direction and having V-shaped track grooves respectively formed in the outer surfaces of opposite sides thereof;

a slider having two side walls each of the side walls having a cross-sectionally trapezoidal accommodation space formed in the inside thereof, the slider being movably straddlingly mounted on said guide rail across the width of said guide rail,

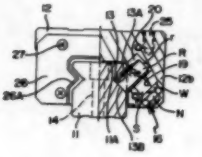
a pair of upper slider support members, respectively, attached to the side walls of the slider and, respectively, having rollers rollable on the upper surfaces of the V-shaped track grooves at opposite sides of the guide rail;

a pair of lower slider support members, respectively, attached to said side walls of said slider and, respectively, having rollers rollable on lower surfaces of said V-shaped track grooves at opposite sides of said guide rail; and

wherein part of at least one of the rollers is received in a cross-sectionally trapezoidal accommodation space in the slider, the trapezoidal accommodation space mating to the respective V-shaped track groove so as to form a substantially rectangular space which receives therein the whole of the roller.

3. A roller-type linear guide comprising:

a guide rail having opposed sides with outer surfaces thereon, the rail extending in a longitudinal direction and having V-shaped track grooves respectively formed in the outer surfaces of opposite sides thereof;



a slider having two side walls and an end face between the side walls at an end thereof, and being movably straddlingly mounted on said guide rail across the width of said guide rail,

a pair of upper slider support members, respectively, attached to the side walls of the slider and, respectively, having rollers rollable on upper surfaces of the V-shaped track grooves at opposite sides of the guide rail;

a pair of lower slider support members, respectively, attached to the side walls of the slider and, respectively, having rollers rollable on lower surfaces of said V-shaped track grooves at opposite sides of said guide rail;

the slider having fixing holes formed therethrough between the inside and the outside of each of the side walls for fixing the upper and lower slider support members therein, and wherein the fixing holes for fixing the lower slider support members extend to and open at the end face of the slider to allow the lower slider support members to be inserted therein.

4,944,609

OIL FILM BEARING AND BUSHING

Lowell S. Salter, Jr., Shrewsbury; Thomas E. Simmons, Westborough, and Charles L. Innis, Jr., Paxton, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Continuation-in-part of Ser. No. 31,422, Mar. 30, 1987, Pat. No. 4,772,137. This application Sep. 19, 1988, Ser. No. 246,450

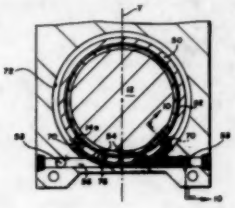
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—118 10 Claims

1. An oil film bearing for a rotating roll neck in a rolling mill, said bearing comprising: means defining a journal surface of the roll neck; a bushing having a cylindrical internal bearing surface surrounding said journal surface, said bushing being contained by and fixed within a bearing chock; inlet means for introducing a continuous flow of oil between said journal surface and said bearing surface at locations which allow the thus introduced oil to be formed hydrodynamically by the

rotary motion of said journal surface relative to said bearing surface into an oil film on which the journal surface is carried at a load zone on one side of the bearing; outlet means for continuously removing oil from said load zone at a location intermediate to the ends of said bushing, thereby providing an



interruption in the load carrying continuity of the hydrodynamically formed oil film and separating said load zone into compound pressure zones; and position sensing means located between said compound pressure zones for monitoring the spatial relationship of said journal surface to said bearing surface at said load zone.

4,944,610

BEARING SEAL AND RETAINER

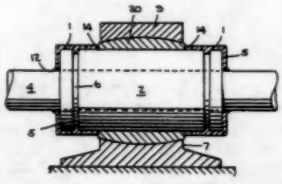
Dennis G. Berg, East Rockaway, N.Y., assignor to Winfred M. Berg, Inc, E. Rockaway, N.Y.

Continuation of Ser. No. 676,290, Nov. 29, 1984, Pat. No. 4,869,602. This application Mar. 20, 1989, Ser. No. 325,891

The portion of the term of this patent subsequent to Sep. 29, 2006, has been disclaimed.

Int. Cl.[5] F16C *33/74*

U.S. Cl. 384—147 **2 Claims**



1. A unitary flexible molded plastic bearing retainer for retaining a bearing in a bearing mounting with the bearing having faces at its opposite ends and spaced locking grooves adjacent to said ends comprising a hollow generally cylindrical body member proportioned for at least partially surrounding the bearing and extending axially of the bearing and having a radially inwardly extending end portion on one end of the body member with a shaft opening and positioned for engaging a bearing end face, a flexible sealing element on said end portion at said shaft opening for sliding sealing engagement with the shaft, an abutment portion on the opposite end of said body member for abutting the bearing mounting, a radially inwardly extending locking flange on the inner surface of the hollow body member for engaging one of said locking groove in the bearing, said sealing element having a generally tapered cross-section with its thinner portion positioned at a shaft retained by said bearing, and said locking flange having a cross-section complementary to the cross-section of the said locking grooves.

4,944,611

DIE CAST ANTI-FRICTION BEARING HOUSING

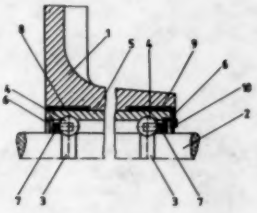
Gerhard Ankenbauer, Rotenburg/Fulda, and Heinrich Hofmann, Schweinfurt, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,450

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1989, 3906801

Int. Cl.[5] F16C *35/077*

U.S. Cl. 384—476 **10 Claims**



1. In combination, a cast bearing housing and an anti-friction bearing housed within the housing, the combination comprising:

the bearing comprising means defining an inner race for a row of bearing rolling elements; an outer ring around the inner race, the outer ring having an outer race defined in it which is placed axially for defining cooperating inner and outer races for rolling elements; a row of rolling elements received in the inner and outer races for rolling therealong; and seals for the anti-friction bearing between the means defining the inner race and the outer ring and located axially to the side of the row of rolling elements for defining a sealed space including the races and the row of rolling elements;

the housing comprising a cast housing cast around the outer ring;

a jacket wrapped about the outer ring in the axial region of the races and of the seal, the jacket being disposed inside the cast housing and separating the outer ring from the cast housing for the protection of the races and the seal during casting of the housing.

4,944,612

TRUCK BED LINER

Michael J. Abstetar, 19 Hein Ave., Plymouth, Wis. 53073, and Richard W. Koppitz, 2001 N. 19th St., Sheboygan, Wis. 53081

Filed Oct. 3, 1989, Ser. No. 416,409

Int. Cl.[5] B60R *13/01*

U.S. Cl. 296—39.2 **6 Claims**

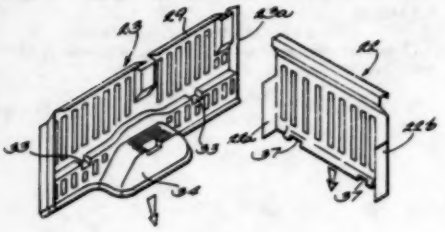
1. In a multi-piece snap-in vehicle bed liner characterized in that no fasteners are required for assembly to the vehicle which has a body with sides including inturned top flanges and a floor, said bed liner including:

a right side panel, a left side panel, and a cab-back panel, all of which panels interact for compression and retention within the body of said vehicle beneath the body top flange and the floor, and

said side panels being C-shaped in cross section, and each including an in-turned upper edge and also a lower edge, and

said side panels constructed and arranged so that they are compressed and retained in place when the in-turned upper edge of the panels are located beneath the in-turned top flange of the vehicle body and when the lower edge of the panel rests on the vehicle floor, and

said cab-back panel including flanges which are disposed behind the front edges of the side panels when the side



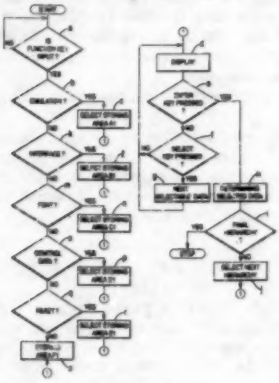
panels are compressed and retained in place, thus to secure the cab-back panel in place.

4,944,613

PRINTING DEVICE

Fumio Fukushige, Fukuoka; Hisanobu Hori, Oonojou, and Kiichiro Tanaka, Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 143,187, Jan. 13, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 442,444
Claims priority, application Japan, Jan. 13, 1987, 62-5352
Int. Cl.[5] B41J 5/30
U.S. Cl. 400—61 4 Claims



1. A device for selecting data items denoting operating conditions of a printer, said device comprising:

a first storing means for storing a plurality of data groups, each of said plurality of data groups having at least a first hierarchy data set and a second hierarchy data set, each data set having at least two data items;

input means for selecting one of said at least two data items of at least one of said data sets, said input means including a data group input key for each of said plurality of data groups and a select key and an enter key;

a second storing means for storing selected data items;

a display means for displaying a data item;

a control means for controlling said first storing means and display means and said second storing means and said input means, wherein upon activation of a data group input keys aid control means causes said display means to display a first data item of the first hierarchy data set of a data group corresponding to the activated data group key. and wherein upon activation of said select key said control means causes said display to display a next data item of a hierarchy data set of the data group corresponding to the activated data group key, and wherein upon activation of said enter key said control means stores in said second storage means a data item displayed on said display and then causes said display to display a first data item of a next hierarchy data set of the data group corresponding to the activated data group key; and,

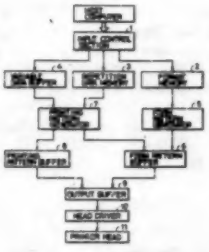
a determining means for determining, upon activation of said enter key, whether a next hierarchy data set is present within the data group corresponding to the activated data group key, wherein upon activation of said enter key and upon determining that there is an absence of a next hierarchy data set said control means releases the printer from a mode for selecting operating conditions.

4,944,614

FORM OVERLAY TYPE PRINTING APPARATUS

Kenmei Tanaka, Hyogo, Japan, assignor to Kanzaki Paper Mfg., Tokyo, Japan

Division of Ser. No. 867,010, May 20, 1986, Pat. No. 4,826,333, which is a continuation of Ser. No. 631,789, Jul. 17, 1984, abandoned. This application Feb. 7, 1989, Ser. No. 307,267
Claims priority, application Japan, Jul. 18, 1983, 58-131500
The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.
Int. Cl.[5] B41J 5/40
U.S. Cl. 400—68 8 Claims



1. A form overlay type document printing apparatus for receiving from a host computer form data, repetition data which remains constant for a first number of sequential pages of a document, and variable data which varies with each page of the document, and for producing a printed output corresponding thereto, the apparatus comprising:

a format memory for storing form data;

a repetiion data memory for storing repetition data;

a variable data buffer for storing variable data;

input data means for supplying form data, repetition data, and variable data received from the host computer to said format memory, said repetition data memory, and said variable data buffer, respectively;

a form pattern generator for generating form printing signals corresponding to said format data stored in said format memory;

a printing pattern generator for generating repetition printing signals corresponding to said repetition data and variable printing signals corresponding to said variable data;

a form pattern buffer for combining said form printing signals and said repetition printing signals to output a selected sequence of combined printing signals for a succession of documents;

an output buffer for combining said combined printing signals with said variable printing signals to produce corre-

sponding print driver signals for each document in said succession of documents; and

means, responsive to said print driver signals, for printing said succession of documents,

whereby only said variable data need be transferred from said host computer for each of said sequential documents pages.

4,944,615

PERMANENT MAGNET PRINT HEAD ASSEMBLY WITH A SQUARE MAGNET

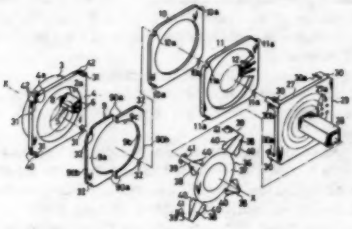
Shigeki Kato, Chiryu, and Yoshihumi Suzuki, Ena, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 35,677, Apr. 7, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,429

Claims priority, application Japan, Apr. 7, 1986, 61-79586; Apr. 24, 1986, 61-62946

Int. Cl.[5] B41J *3/12*

U.S. Cl. 400—124 **5 Claims**



1. A print head assembly of a printing device which moves along a print line to perform a printing operation and includes an outer peripheral portion having a specific width in a paralleled direction to the print line and a specific height in a perpendicular direction to the print line, comprising:

a plurality of cores arranged in a circular ring;

a yoke member surrounding and supporting the cores;

solenoid coils wound individually around the cores;

a plurality of armature members arranged individually facing the cores;

a resilient member swingably supporting the armature members and urging the armature members in the one direction by means of its resilient force;

a plurality of print wires operatively connected to the armature members corresponding thereto; and

a permanent magnet member fixed to the yoke member and forming a plurality of magnetic paths, each of which passes through the yoke member, one of the cores and one of the armatures, said magnet member urging the armature members in the other direction by means of its magnetic force,

said resilient member accumulating an urging force in one direction in such a situation that the armature members are urged in the other direction by the magnetic force of the permanent magnet member, and moving that armature member corresponding to a selected one of the solenoid coils in one direction, by means of the accumulated urging force, when the magnetic force of the permanent magnet member is cancelled by selective excitation of the solenoid coils, thereby driving that printing wire corresponding to the moved armature member toward a printing position,

said permanent magnet member including a square outer periphery, having a pair of first outer peripheral edges extending substantially along the print line, and a pair of second outer peripheral edges extending substantially at right angles to the print line, the distance between the paired first outer peripheral edges being equivalent to said specific height of the print head assembly, and the distance between the paired second outer peripheral edges being equivalent to said specific width of the print head assembly said permanent magnet member further having a circular inner periphery to define a center opening which is concentric with said circular ring along which said plurality of cores are arranged, and

said yoke member has an outer periphery which is substantially the same form as that of the permanent magnet member.

4,944,616

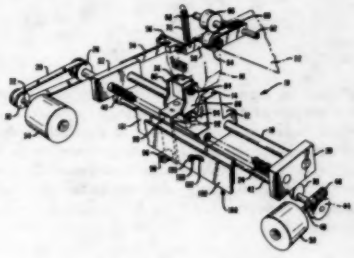
PASSBOOK READ/WRITE MECHANISM

Shingo Watanabe, Chigasaki, and Shohei Murakami, Hadano, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 6, 1989, Ser. No. 432,120

Int. Cl.[5] B41J *5/00*

U.S. Cl. 400—105 **16 Claims**



1. A passbook printer for use with a passbook, said printer comprising a

carriage, a

print head and means for moving the print head across the printer, a

platen operating at a printing station with said print head and carried by said carriage,

means for driving said carriage across said printer in a direction normal to the path of the passbook past the printing station, and a

magnetic head carried by said carriage and positioned to operate with a magnetic stripe on said passbook, said printer including means for moving the print head and the magnetic head relative to each other and said printer including means for moving said heads in synchronism across said printer to print data on said passbook and to read data from and to write data into said magnetic stripe on said passbook.

4,944,617

ENCODER EMPLOYING A SHOCK ABSORBING TENSION SPRING

John Tribert, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 24, 1989, Ser. No. 342,215

Int. Cl.[5] B41J *9/06, 9/20*

U.S. Cl. 400—157.2 **10 Claims**

1. An apparatus comprising:

a beam having first and second beam end portions;

mounting means including a pivot member for mounting said beam thereon for pivotal movement to enable said first beam end portion to be moved between a first position and a second position;

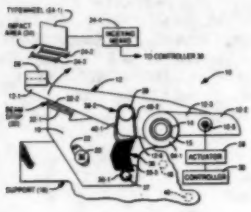
a beam stop;

a mounting member on said beam; and

a tension spring coupled to said beam and said mounting means to resiliently bias said first beam end portion to said first position against said beam stop;

said tension spring having a body portion and first and second spring end portions extending from said body portion, with said first spring end portion being secured to said mounting means;

said second spring end portion having a first generally U-shaped portion to partially surround said mounting member and also having a second generally U-shaped portion to enable a portion of said beam to be received therein; and



said second spring end portion being shaped to cause said body portion of said tension spring to assume an arched position when said first beam end portion is positioned against said beam stop and also being shaped to increase an area of contact between said first generally U-shaped portion and said mounting member as said first beam end portion is moved from said first position toward said second position.

4,944,618

MULTICOLOR INK RIBBON SWITCHING SYSTEM FOR PRINTER

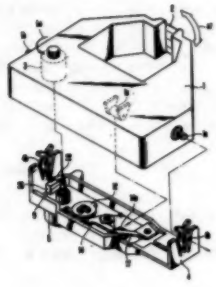
Yorihiko Ideta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 7,203, Jan. 27, 1987, abandoned. This application Dec. 15, 1988, Ser. No. 285,294

Claims priority, application Japan, Jan. 27, 1986, 61-15284

Int. Cl.[5] B41J *33/14, 35/14*

U.S. Cl. 400—211 **3 Claims**



1. A multicolor ink ribbon switching system comprising:

a ribbon cassette swingably supported in a base;

a cassette swinging mechanism for swinging the multicolor ribbon cassette and changing colors of a ribbon; and

a ribbon feed mechanism for winding the ribbon in said ribbon cassette;

said cassette swinging mechanism and said ribbon feed mechanism having a common single driving source movable in a first rotational direction and a second rotational direction opposite to the first rotational direction;

said cassette swinging mechanism comprising:

a first one-way clutch for transmitting a rotational force in said first rotational direction of said single driving source and

a first converting mechanism for converting movement of said first one-way clutch into rotation of said cassette, said first converting mechanism comprising:

a switching roller disposed on a bottom surface of said cassette opposite to said base and rotatably mounted in said ribbon cassette,

a disc-shaped cam disposed substantially parallel to said base and coaxially coupled to said first one-way clutch, said cam having a center of rotation and a circumferential surface as well as a shape for providing different distances from said center of rotation to various portions of said circumferential surface in accordance with various rotational angles, and

a lever means, said lever means comprising a lever, a roller contacting with said circumferential surface of said cam at one end thereof, a fixed shaft disposed at the center of said lever and operative to rotate said lever on a plane substantially parallel to said base, and an L-shaped abutment piece engageable with said switching roller for moving said roller by urging it and thereby converting the rotational movement of said lever into shaft movement of said ribbon cassette in a direction substantially perpendicular to said base, and

said ribbon feed mechanism comprising:

a second one-way clutch for transmitting the rotational force in said second rotational direction of said single driving source and

a second converting mechanism for converting movement of said second one-way clutch into a winding motion of the ribbon in said ribbon cassette, said second converting mechanism comprising a ribbon running roller rotatably mounted in said ribbon cassette, and a torque piece having one end connected to said second one-way clutch and the other end coupled to a shaft of said ribbon running roller.

4,944,619

CONSTRUCTION FOR MOUNTING AN INK RIBBON CASSETTE IN A HEAT TRANSFERABLE LINE PRINTER

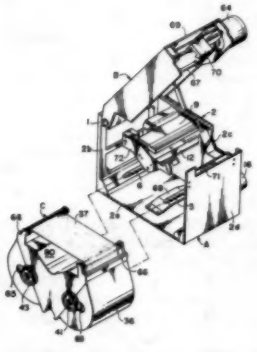
Kenji Suzuki, Shizuoka, Japan, and Dunstan P. Sheldon, Altadena, Calif., assignors to Star Seimitsu Kabushiki Kaisha and Mag-Tek Inc., both of, Japan

Filed Jun. 8, 1988, Ser. No. 204,102

Claims priority, application Japan, Jun. 8, 1987, 62-141554

Int. Cl.[5] B41J *33/00*

U.S. Cl. 400—224.2 **3 Claims**



1. A line printer comprising:

upper and lower units pivotably connected with each other through a pivot shaft, the upper unit having therein a platen extending parallel with the pivot shaft, the lower

unit having therein a thermal print head extending under and along the platen of the upper unit and a pair of spool shafts fixed at one end thereof to the inside of a back side portion of the lower unit and extending below the thermal print head and parallel to the pivot shaft;

a symmetrical ink ribbon cassette removably mounted in the lower unit and carrying an ink ribbon passing between the platen and the thermal print head, the ink ribbon cassette comprising a casing having front and back sides and having a symmetrical shape to enable mounting of the casing in the lower unit in either a frontward position in which the casing front side lies adjacent the front side of the lower unit or a backward position in which the casing back side lies adjacent the front side of the lower unit, a pair of guide rollers extending parallel with each other on an upper side of the casing for guiding the ink ribbon therebetween; first and second spools disposed within the casing and detachably coaxially receiving therein the respective spool shafts of the lower unit for reversibly transporting the ink ribbon therebetween, and a cylindrical hub gear fixedly disposed on and around each of the opposite ends of the respective spools and projecting outwardly through a corresponding opening formed in one of the front and back sides of the casing;

power transmitting means carried by the lower unit and having a driving gear selectively engageable with one of the two cylindrical hub gears of the first and second spools, depending on whether the casing is mounted in the frontward or backward position, for driving the selected spool to wind the ink ribbon through engagement between the driving gear and the cylindrical hub gear;

back-tension applying means carried by the lower unit and having a back-tension gear selectively engageable with one of the two cylindrical hub gears other than the ones engageable with the driving gear of the power transmitting means, depending on whether the casing is mounted in the frontward or backward position, for preventing slipping rotation of the spool being used for feeding the ink ribbon to the other spool;

locking means for releasably locking the ink ribbon cassette in an operating position thereof in cooperation with the pair of spool shafts within the upper and lower units, the locking means comprising a pair of shoulders formed outside the respective guide rollers on the upper side of the casing, a pair of rods fixedly disposed within the upper unit so as to extend along and engage with the respective shoulders, a plate spring disposed on the bottom of the lower unit for urging the casing against the rods to thereby engage the shoulders with the rods, the rods being immovably positioned relative to the lower unit, and a flange formed on an end of each rod so that the flange engages with one of the opposite ends of the shoulders to thereby hold the ink ribbon cassette in position with respect to the axial directions of the spool shafts;

first gear-adjusting means coacting with the power transmitting means for resiliently absorbing impact between the teeth of the cylindrical hub gear and the driving gear, which impact is caused when the ink ribbon cassette is loaded into the lower unit with these gear teeth being mutually aligned, and for subsequently adjusting these gears to suitably mesh with each other; and

second gear-adjusting means coating with the back-tension applying means for resiliently absorbing impact between the teeth of the cylindrical hub gear and the back-tension gear, which impact is caused when the ink ribbon cassette is loaded into the lower unit with these gear teeth being mutually aligned, and for subsequently adjusting these gears to suitably mesh with each other;

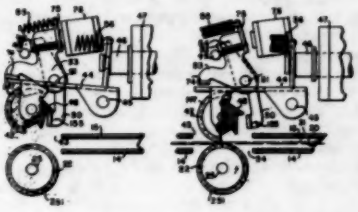
whereby the ink ribbon cassette is releasably simply locked in the same operating position regardless of whether the ink ribbon cassette is mounted in the lower unit in the frontward or backward position.

4,944,620

PRINTER DEVICE FOR DUPLICATE SLIPS AND THE LIKE

Milton Scorzafava, Rowland Heights, and John G. Clary, Pasadena, both of Calif., assignors to Addmaster Corporation, Monrovia, Calif.

Filed Aug. 7, 1989, Ser. No. 390,636
Int. Cl.[5] B41J *11/50*
U.S. Cl. 400—608.1 **9 Claims**



1. A printer for printing data on each of a pair of superimposed record mediums comprising the combination of

a printing device,

means for guiding said mediums past said printing device,

a feed roller,

means for rotating said feed roller,

a pinch roller for pressing said mediums into engagement with each other and with said feed roller, said rollers having greater frictional gripping characteristics than the frictional gripping characteristics of said mediums with each other,

a braking device coupled to said pinch roller,

means for (preventing) enabling said braking device whereby to prevent rotation of said pinch roller whereby (prevent) to enable said feed roller to advance one only of said mediums past said printing device, and

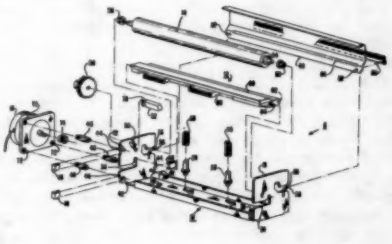
means for thereafter (enabling) disabling said braking device to enable said feed roller to advance the other of said mediums past said printing device.

4,944,621

SELF-CONTAINED PRINTHEAD/PAPERDRIVE MECHANISM

Kenneth D. Uecker, Janesville, Wis., assignor to Burdick Corporation, Milton, Wis.

Filed Dec. 22, 1988, Ser. No. 288,524
Int. Cl.[5] B41J *29/02*
U.S. Cl. 400—691 **13 Claims**



1. A self-contained printhead/paperdrive mechanism, comprising:

a single piece frame formed of a single sheet of material, having a substantially straight base portion and end portions formed so as to project substantially vertically from

opposite ends of said base portion, each of said end portions having a plurality of guide slots formed therein, with corresponding ones of said guide slots from each of said end portions forming a respective pair of said guide slots;

a platen/paperdrive roller comprising a shaft having opposite end portions, said shaft having a length substantially equal to the length of said base portion between the opposite ends of said frame;

an elongated printing means having opposite end portions projecting axially therefrom and a length between said opposite end portions which is substantially equal to the length of said base portion between the opposite ends of said frame; and

at least one spring member;

wherein the opposite end portions of each of said platen/drive roller and elongated printing means, respectively, engage a respective pair of said guide slots formed in said end portions of said frame; and

wherein said spring member is positioned so as to urge both said platen/drive roller and printing means into a fixed location relative to said guide slots so as to locate said platen/drive roller and printing means, respectively, securely on said frame and in an operating position.

4,944,622

WRITING IMPLEMENT

Tyng-Jen Sheu, 3, 11F-7, Fu-Shin 2nd Rd., Lin-Ya Dist. Kaohsiung, Taiwan

Filed Mar. 16, 1989, Ser. No. 325,697

Int. Cl.[5] B43K *24/10, 24/14, 24/16, 24/18*

U.S. Cl. 401—90 **1 Claim**

1. A writing implement comprising:

an elongated tube having an upper open end and a lower end in which a clamping means is mounted, a propelling means associated with said clamping means having a retractable lower portion protruding out from said lower end of said tube, a central bore extended from said upper open end to said clamping means, said clamping means being adapted to clamp leads coming from said central bore and prevent said leads from moving toward said central bore, said propelling means being adapted to temporarily release said clamping means and enable said leads to protrude from said retractable lower portion thereof for writing purposes by means of depressing said lower portion of said propelling means into said lower end of said tube and then letting said lower portion spring back to its original position; wherein the improvement is characterized in that said tube has a plurality of positioning slots axially formed around an inner surface thereof near said upper open end, each positioning slot having an upper and a lower end of a predetermined length, and said central bore of said elongated tube includes an upper section as well as a lower section the diameter of which is smaller than that of said upper section, said lower section having a lower end connected with said clamping means, and a plurality of radial grooves extended from said lower section correspondingly aligned with said positioning slots for receiving said leads, each of said grooves having an upper end communicating with said upper section and a lower end bounded by an inclined inner face of said tube, said inclined inner faces converging toward said lower end of said lower section;

a lead supplying rod having an upper and lower end in which a through bore is axially formed, said lower end of said lead supplying rod being fitted within said lower section of said central bore of said tube and connected with said clamping means so that said leads can pass through said through bore of said lead supplying rod into said clamping means, said lead supplying rod having a slot radially extended from said through bore thereof communicating with one of said grooves of said tube so as to permit said leads to singly enter said through bore thereof via said slot of said lead supplying rod and a first engaging member formed near said upper end thereof, said first engaging member including a pair of opposite sliding grooves;

an elongated cylindrical body with an upper end and a lower end having a cylindrical cavity formed therein, said cavity being adapted to receive said upper end of said lead supplying rod, said elongated cylindrical body having a second engaging member including two opposite protrusions radially protruding into said cavity of said cylindrical body, said protrusions being adapted to slidably engage with respective of said sliding grooves of said first engaging member of said lead supplying rod so that said lead supplying rod can be rotated along with said elongated cylindrical body, and a push rod extended from the bottommost cylindrical cavity into said through bore of said lead supplying rod so as to push a lead received in said through bore into said clamping means when said elongated cylindrical body is depressed, said elongated cylindrical body having a mounting hole radially formed near said upper end thereof, said mounting hole having a spring and a ball received therein, said ball being biased by said spring so as to engage with one of said positioning slots formed near said upper open end of said tube allowing said elongated cylindrical body to be placed between a first position where said elongated cylindrical body protrudes upward and a second position where said push rod of said elongated cylindrical body pushes the lead received in said through bore into said clamping means; and

a spring member mounted between said upper end of said lead supplying rod and the bottommost cylindrical cavity which urges said elongated cylindrical body to an upward protruding position; whereby said slot of said lead supplying rod may be rotated to communicate with an adjacent groove of said tube by manually rotating said elongated cylindrical body several degrees from one to another of said positioning slots and said lead in said grooves can enter said through bore of said lead supplying rod and be pushed into said clamping means when said elongated cylindrical body is depressed.

4,944,623

WINDOW CLEANING APPARATUS

Arley McNeil, Box 271, Sonoita, Ariz. 85637

Filed Aug. 11, 1989, Ser. No. 392,456

Int. Cl.[5] A47L *1/08*

U.S. Cl. 401—25 **7 Claims**

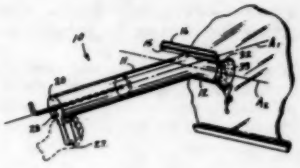
1. A window cleaning apparatus comprising,

an elongate body including a first hollow cylindrical housing secured in alignment to a second hollow cylindrical housing, wherein the first cylindrical housing defines a first chamber in communication with a second chamber defined within the second cylindrical housing, and

a porous applicator head mounted at a forward end of the

second cylindrical housing remote from the first cylindrical housing, and

pressurizing means contained within the first cylindrical housing to direct a quantity of cleansing fluid contained within the elongate body between the pressurizing means and the applicator head for directing the fluid through the applicator head onto a surface to be cleaned, and



wherein the first cylindrical housing is defined by a first axis and the second cylindrical housing is defined by a second axis, wherein the second axis is arranged at an obtuse angle relative to the first axis, and

wherein the porous applicator head includes a truncated conical sponge member integrally secured within an internally threaded cap, the internally threaded cap being selectively securable to the second cylindrical housing.

4,944,624

WRITING INSTRUMENT STAND/HOLDER ATTACHABLE TO CAP POCKET CLIP

R. Darryl Garland, Santa Barbara, Calif., assignor to Larry K. Roberts, Newport Beach, Calif., a part interest

Filed Sep. 22, 1989, Ser. No. 411,097

Int. Cl.[5] B43K *23/02;* A47F *7/00*

U.S. Cl. 401—131 **16 Claims**

1. A stand for writing instruments having a barrel and a removable cap, the cap characterized by a cap body to which is affixed a pocket clip of a spring material, the clip being attached to the cap at a first end of the clip, and wherein the pocket clip second end terminates in a clip protrusion, the stand comprising:

a stand base structure; and

means for attaching the cap to the stand base by cooperative engagement of the stand base with the pocket clip, so that the cap is supported by the stand base in a generally upright or inclined position, and wherein said attaching means is defined by said stand base and comprises means for supporting the clip body and cap such that the second end of the pocket clip is pivoted away from the cap body, and wherein said supporting means comprises a first structure defined by said stand base for wedging between the cap body and pocket clip, and a second structure defined by said stand base for engaging the clip protrusion, thereby locking the clip and cap in place in said generally upright or inclined position;

whereby the writing instrument barrel may be inserted into the cap being supported by the stand base so that the barrel is supported in a generally upright or inclined position.

4,944,625

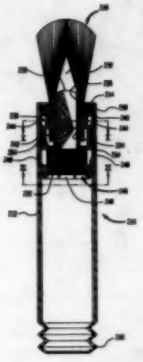
POWDER-APPLYING BRUSH

Menachem Futter, Staten Island, N.Y.; James E. Wilson, Bound Brook, N.J., and Annette M. Golden, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Oct. 21, 1988, Ser. No. 260,768

Int. Cl.[5] A45D *33/06;* A46B *11/04*

U.S. Cl. 401—153 **44 Claims**



1. A powder-dispensing brush, comprising a substantially rigid housing having a capacity selected such that a predetermined quantity of powder can be stored in said housing; bristles projecting outwardly from one end of said housing; dispensing means positioned in said one end of said housing for dispensing powder from said housing into said bristles; filtering means for filtering powder before it is dispensed from said dispensing means, whereby said filtering means inhibits said dispensing means from becoming clogged; and propelling means located at an opposite end of said housing for propelling powder from said housing through said dispensing means and into said bristles, said propelling means including compressible bellows which communicate with said housing, said bellows being manually compressible by a thumb of a user to thereby reduce the capacity of said housing and being automatically expandable after their compression to thereby cause outside air to be sucked into said housing through said dispensing means and said filtering means, whereby powder is expelled from said filtering means and returned to said housing in a loosened and aerated condition.

4,944,626

APPARATUS HAVING TWO ADJUSTABLE SLIDE SUPPORTS WHICH HAVE ATTACHMENT SURFACES FOR ATTACHING TWO HOLDING DEVICES

Armin Dommer, Eichweg 13, and Dieter Dommer, Bahnhofstr. 5, both of, 7257 Ditzingen 1, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 304,059

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802663

Int. Cl.[5] F16D *1/00*

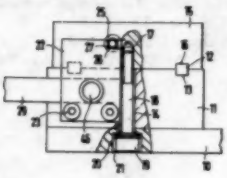
U.S. Cl. 403—3 **15 Claims**

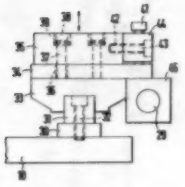
1. An apparatus having two slide supports, adjustable with respect to one another, the slide supports each have an attachment surface for attaching two holding devices, the apparatus further comprising:

the slide supports each comprising a slide support base plate (11,34) and an attachment plate (15,35) having the attachment surfaces;

said attachment plate (15,35) connected with spring tension in an adjustable manner relative to said slide support base plate (11,34) with spring-stressed bolts (18,37) oriented perpendicular to the attachment surfaces;

said attachment plate (15) of a first slide support of the slide supports perpendicularly adjustable relative to a direction





of adjustment of the slide supports on a first slide support base plate (11); and

said attachment plate (35) of a second slide support of the slide supports perpendicularly adjustable relative to the attachment surface of a second slide support base plate (34);

an attachment block (22) attached in a first area of a front side of said first slide support base plate (11) of said first slide support, said attachment block (22) extending into a second area of said attachment plate (15);

in an upper side of said attachment block (22) a first adjustment bolt (24) mounted in an axially non-displaceable but rotatable manner and mateable within a receptacle (28) of said attachment plate (15), said first adjustment bolt (24) oriented perpendicular relative to a sliding direction of adjustment of said slide supports; and

said first slide support base plate (11) and said attachment plate (15) of said first slide support having reception grooves (13, 16) for guide bars (12) and said guide bars (12) positioned parallel to said first adjustment bolt (24).

4,944,627

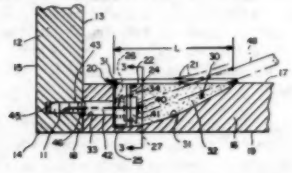
APPARATUS AND METHOD FOR JOINING WORKPIECES

Max W. Durney, Penngrove, Calif., assignor to Durney/Alexander, San Francisco, Calif., a part interest

Filed Nov. 17, 1988, Ser. No. 272,444

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—8 **22 Claims**



1. In apparatus for securely fastening a first workpiece to a second workpiece, said apparatus including a mortise formed in a surface of said first workpiece with a load-bearing face of said mortise oriented substantially perpendicular to said surface, a fastener receiving bore extending between said load-bearing face of said mortise and an edge of said first workpiece, a fastener receiving insert member including an insert portion having a front wall mating with said load-bearing face of said mortise and an insert bore aligned with said fastener receiving bore, and fastening means mounted in said insert bore and in said fastener receiving bore, said fastening means including an end portion having attachment means thereon for fastening to said second workpiece the improvement in said apparatus comprising:

said insert portion surrounding said insert bore to provide a seat supporting said fastening means completely around said insert bore; and

said mortise, insert member and fastening means are dimensioned for insertion of both said insert member and said fastening means into said mortise from said surface in said first workpiece having said mortise formed therein.

4,944,628

QUICK COUPLING MEANS FOR A WORKING IMPLEMENT OF AN EXCAVATING MACHINE

Fritiof Huldén, Pl 3155,S-660 60, Molkom, Sweden

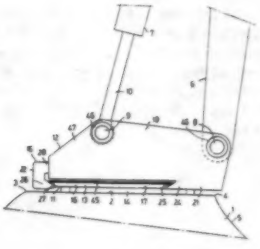
PCT No. PCT/SE88/00020, § 371 Date Jun. 28, 1989, § 102(e) Date Jun. 28, 1989, PCT Pub. No. WO88/05847, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 22, 1988, Ser. No. 378,190

Claims priority, application Sweden, Jan. 28, 1987, 8700319

Int. Cl.[5] F16B *1/00*

U.S. Cl. 403—24 **15 Claims**



1. A coupling means for detachably coupling a working implement (1) to the operating arm of an excavating machine, said implement having an upper surface facing the operating arm, said coupling means comprising a first attachment member (11) which is rigidly mounted to the upper surface of the implement (1) and comprises a coupling element (13), and a second attachment member (12) supported by the operating arm stick (6) and operating cylinder (7) via horizontal, parallel shafts (8, 9) and comprising a coupling element (15) consisting of two locking parts (21, 22) arranged movable in relation to each other to be brought into locking engagement with the coupling element (13) of the first attachment member (11) by means of a power-generating means (32), said coupling elements (13, 15) having cooperating engagement surfaces (17, 25, 27) which, when the attachment members (11, 12) are connected together, are located in a common reference plane (R) which is perpendicular to a common central plane for the stick (6) and operating cylinder (7), characterised in that all engagement surfaces (17, 25, 27) of the two coupling elements (13, 15) have a circle arc-shaped extension in said reference plane (R) and have the same radius.

4,944,629

QUICK CHANGE TOOL HOLDER

Johnnie E. Peveto, El Paso, Tex., assignor to Acustar, Inc., Troy, Mich.

Filed Mar. 14, 1989, Ser. No. 322,869

Int. Cl.[5] F16B *21/00*; B25G *3/18*

U.S. Cl. 403—330 **6 Claims**

1. A quick change tool holder for a machine or the like

having two basic assemblies which are normally attached together but are readily detached one from the other, comprising:

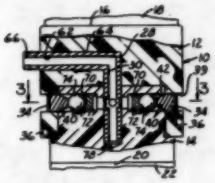
a first component assembly having a flat surface adapted to be fastened to the machine or the like;

a second component assembly having a flat surface adapted to be fastened to a tool or the like;

one of the component assemblies having a central boss formed thereon with an axis extending substantially normal to the flat surface;

the other component assembly having a recess formed therein with an axis extending substantially normal to the flat surface and with the recess shaped in correspondence to the boss whereby the boss is received into the recess during assembly to an attached mode of operation;

the boss portion having a circumferentially extending channel formed therein;



at least one elongated lock bar pivotally mounted to the other component assembly at an end portion and having an edge portion movable about the pivot mounted end portion so that the edge portion is movable into and out of the channel to lock and unlock the boss in the recess respectively;

means for selectively pivoting the lock bar from a lock position to an unlock position thus permitting separation of the component assemblies including

a radially extending cylinder bore extending in the boss portion normally to the boss axis and intersecting the channel; a reciprocal piston in the cylinder bore; means for selectively directing pressurized air to the radially inward portion of the reciprocal piston; means moved by the piston adjacent the edge portion of the lock bar for pivoting the edge portion radially outwardly to the unlock position.

4,944,630

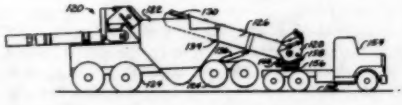
CONNECTOR AND METHOD OF CONNECTION BETWEEN A ROAD MAKING MACHINE AND THE FIFTH WHEEL OF A TRACTOR

James D. Brock, Chattanooga, Tenn.; Donald W. Smith, Aurora, and James H. Bassett, Sycamore, both of Ill., assignors to Barber-Greene Company, DeKalb, Ill.

Filed Feb. 7, 1989, Ser. No. 307,684

Int. Cl.[5] E01C *19/00*

U.S. Cl. 404—83 **27 Claims**



1. A reversible connector between a conveyor supported on a chassis and the fifth wheel of a tractor, the conveyor being moveable relative to the chassis, the reversible connector comprising:

track means attached to the conveyor;

support means slideably supported in the track means;

locking means to reversibly secure the slideable support means to the track means in a plurality of positions; and

pin means attached to the sliding support means, the pin means capable of connection to the fifth wheel of a tractor.

25. A method of reversibly connecting an apparatus to a tractor having a fifth wheel, the apparatus having a chassis, a downwardly extending conveyor means attached to the chassis, the conveyor means having means to reversibly engage the fifth wheel near its distal end, and means for moving the conveyor means relative to the chassis, the method comprising the steps of:

raising the distal end of the conveyor means to the height of the fifth wheel; and

moving the apparatus relative to the tractor to engage the fifth wheel with the fifth wheel engagement means.

4,944,631

MACHINE FOR REDEVELOPING THE CONSTRUCTIONAL LAYERS OF ROADS

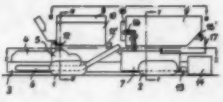
Urs Egli, Wetzikon, Switzerland, assignor to Egli AG, Wetzikon, Switzerland

Filed Nov. 10, 1988, Ser. No. 269,995

Claims priority, application Switzerland, Nov. 18, 1987, 04481/87

Int. Cl.[5] E01C *23/08, 23/12*

U.S. Cl. 404—91 **4 Claims**



1. A machine for constructing a road layer through reuse of old material removed from a road, comprising:

a motor whose heat is transferred by means selected from the group consisting of a cooling-water circulation system and an exhaust flow system;

a chassis for said motor, said chassis being of box-like construction and divided into a plurality of tanks for fuel, additives and hydraulic oil;

a silo for receiving said old material, said silo being mounted on said chassis;

a horizontal stream crusher having a major longitudinal axis through a length thereof, said axis being directed parallel to said road layer, said crusher feedable with said old material in regulatable quantities from said silo, said crusher having associated therewith a means for feeding said old material in regulatable quantities from said silo;

a mixer mounted on said chassis having an opening for receiving said old material at an upper end thereof distant from said road layer and said mixer being subjected to heat exchange by said heat transfer means;

a dosaging conveying device comprising a scraper band positioned between said crusher and said mixer, said scraper band being angled upward above said crusher with an end of said scraper band terminating over said opening of said mixer;

a screed drawn along behind said chassis; and

a conveyor worm between said mixer and said screed capable of feeding prepared material ready for distribution therebetween.

4,944,632

DEVICE FOR DISPENSING ASPHALT REPAIR MATERIALS

Harold W. Dillingham, P.O. Box 661, Jacksonville, Tex. 75766

Filed Feb. 16, 1989, Ser. No. 310,940

Int. Cl.[5] E01C *19/06, 19/18*

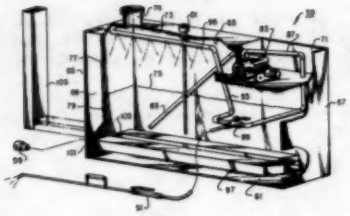
U.S. Cl. 404—111 **12 Claims**

1. An improved tack oil dispensing apparatus of the type used in repairing potholes in asphalt pavements, the apparatus comprising:

a tack oil tank adapted to be mounted on a portable base for transporting the tank to a repair site, the tack oil tank having a bottom wall, a top wall and interconnecting sidewalls which together define a closed interior having a

bottom region and a top region, respectively, the closed interior being supplied with a preselected level of tack oil which comprises a liquid-liquid emulsion, the level of the tack oil being below that of the top wall;

circulating means within the tack oil tank for continuously circulating tack oil from the bottom portion of the closed interior to the top portion thereof, the circulating means including dispensing means for dispensing the recirculated tack oil downwardly within the tank interior onto the top of the liquid level therein, to thereby maintain the tack oils within the tank in an emulsified state;



heat transfer means located within the tack oil tank for heating the tack oil to thereby maintain the tack oil in a liquid state; and

wherein the circulating means located within the tack oil tank includes a pump having an inlet conduit for collecting liquid from the bottom portion of the tank and an outlet conduit leading to the top portion thereof and wherein the dispensing means comprises a spray bar which communicates with said outlet conduit, said spray bar having a plurality of apertures for dispensing recirculated liquid downwardly onto the top of the liquid level within the tank.

4,944,633

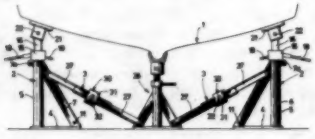
BOAT SUPPORT MEANS

Frank B. Robb, Willoughby, Ohio, assignor to Jos. Dyson & Sons, Inc., Painesville, Ohio

Continuation-in-part of Ser. No. 215,234, Jul. 5, 1988, abandoned. This application Apr. 10, 1989, Ser. No. 335,707

Int. Cl.[5] B63C *1/08, 15/00*

U.S. Cl. 405—3 **14 Claims**



1. Boat cradle and storage means comprising a set of at least two spaced main support units of substantially identical construction, each including a base member to engage the surface above which a boat or the like is to be supported, a substantially vertical column extending upwardly from the base member, a pair of brace parts extending angularly and engaging the column and base member, said brace parts being positioned to facilitate nesting of like units with the columns of each in closely spaced relation with respect to one another and tension units connecting the support units to maintain the same in spaced relation, wherein the base member is chevron-shaped, comprising a pair of diverging wing-like portions, the column is fixed at its lower end at the juncture of the portions, the brace parts are fastened at their lower extremities to corresponding ends of the wing-like portions and at their upper ends to the upper end of the column, the column is fastened to the base member in a position spaced from the apex formed at the juncture of the wing-like portions, to facilitate nesting of a series of support means with the column of each in substantial alignment, and relatively close to one another.

4,944,634

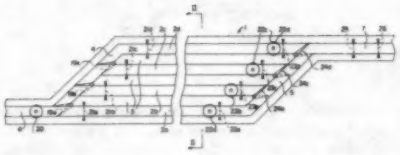
ANTI-FRICTION COMPOSITION CONTAINING MGO AND METHOD

William Alexander, Naperville, and Mark Bertane, Elgin, both of Ill., assignors to American Colloid Company, Arlington Heights, Ill.

Filed Oct. 4, 1985, Ser. No. 784,604

Int. Cl.[5] C09K *7/00*; E02F *5/10*

U.S. Cl. 405—184 **16 Claims**



11. A method of moving one solid object with respect to another solid object, wherein said solid objects are in close proximity, one to another, such that movement of said one solid object with respect to the other solid object is hindered by frictional forces exerted between the solid objects on frictionally engaging adjacent surfaces, the method comprising:

contacting said frictionally engaging adjacent surfaces of said solid objects with a pumpable composition comprising a water swellable smectite clay and MgO, wherein the MgO comprises at least 0.025% based on the dry weight of the water swellable clay, while forcing said one solid object to move with respect to the other solid object against the frictional force remaining between the two adjacent surfaces.

4,944,635

METHOD AND DEVICE FOR ACCUMULATING OBJECTS IN A PNEUMATIC CONVEYANCE SYSTEM

Michel Carlier, Wambrechies, and Olivier Blic, Bondues, both of France, assignors to Oerlikon Motch Corporation, Hayward, Calif.

Filed Sep. 23, 1988, Ser. No. 249,357

Claims priority, application France, Oct. 2, 1987, 87 13673

Int. Cl.[5] B65G *51/02*

U.S. Cl. 406—10 **20 Claims**

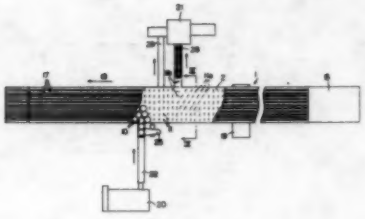
1. A method of accumulating a variable number of objects such as empty containers comprising the steps of providing means for air conveying the containers along an upstream row emerging from an upstream handling machine and along a downstream row entering a downstream handling machine, providing a plurality of separate, independent, parallel accumulation rows between the upstream and downstream rows with each accumulation row providing a channel for flow-through of objects from the upstream row to the downstream row, monitoring the absence or presence of objects at certain points of the various rows, closing access to each accumulation row in which the presence of objects is monitored, diverting containers to another accumulation row, and releasing objects from accumulation when the absence of objects is monitored at certain points in various rows.

4,944,636

METHOD AND DEVICE FOR THE TRANSFERRING AND ACCUMULATING OF PACKING ELEMENTS BY AIR CONVEYING

Michel Carlier, Wambrechies, and Frederic Bernard, Sailly-Lez-Lannoy, both of France, assignors to Oerlikon Motch Corporation, Hayward, Calif.

Filed Sep. 7, 1988, Ser. No. 241,349
Int. Cl.[5] B65G 51/02
U.S. Cl. 406—72 10 Claims



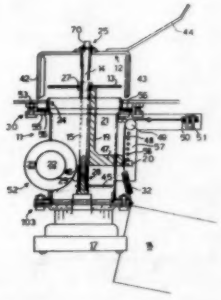
1. A device for the transferring and accumulating of packing elements in the form of a box which is open on one face, comprising an air-conveyor defining an accumulating path in a closed loop (1), at least one upstream machine (20) feeding packing elements to the accumulating path and at least one downstream machine (21) receiving with packing elements from the accumulating path, the closed loop (1) being arranged substantially vertically and including an upper horizontal path portion (2), a lower horizontal path portion (3) located below the upper portion, and two curved end connecting portions (4, 5), certain of said upstream and downstream machines being connected to the upper portion of the path and other said machines being connected to the lower portion of the path.

4,944,637

VALVED SEED OUTLET

Gilbert K. Fletcher, P.O. Box 527, Emerald, Queensland 4720, Australia

Continuation of Ser. No. 100,622, Sep. 24, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 393,852
Claims priority, application Australia, Jan. 30, 1987, PI0110
Int. Cl.[5] B65G 53/40
U.S. Cl. 406—132 7 Claims



1. A valved seed outlet to be used in a seed apparatus to dispense fluffy or hairy coated seed that is prone to bridging wherein a storage container with walls contoured to lead seed therein gravitationally to an opening is used, the valved seed outlet being mounted in said opening of said container, said valved seed outlet comprising:

a body part with a first passage therethrough to lead seed from the storage container, the first passage having first and second ends;

the first end being provided with a mounting means thereat whereby the valved seed outlet may be mounted beneath said storage container at said opening therein externally of the container;

a valve seat at the first end defining an orifice by which seed may flow from said storage container;

a valve means mounted for operative movement orthogonal to the valve seat within the container, said movement achieved by a valve support disposed into the first passage from the lower surface of the valve means, said movement regulating a flow area into the orifice, said flow area being defined by the separation between the outer circumference of the valve seat and the outer circumference of the valve means, so that the flow of seed past the orifice is metered by the position of the valve means and the flow of seed is stopped when the valve means engages the valve seat to block the orifice, said valve means being restrained from rotary motion by at least one support post firmly affixed to the body part of said valve seed outlet;

seed sweep means rotatively mounted to disturb seed at the orifice;

means by which the seed sweep means may be continuously or intermittently activated;

a second passage, transverse to the first passage adjacent the second end thereof, the second passage being operative, in use, with a flow of air therethrough to draw seed through the orifice by aspiration, the second passage being restricted in size adjacent the first passage to increase aspiration utilizing the venturi effect; and

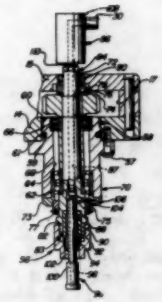
the seed sweep means being operative to disturb seed at the orifice, the seed sweep means including at least a first set of depending arms to sweep closely around the periphery of the valve and its valve seat.

4,944,638

REMOVABLE SPINDLE FOR DRILL HEADS

Lawrence F. Brohammer, 5078 Longview, Troy, Mich. 48098

Continuation of Ser. No. 200,634, May 31, 1988, Pat. No. 4,867,618. This application Jul. 19, 1989, Ser. No. 382,481
Int. Cl.[5] B23B 27/12; B23Q 5/04
U.S. Cl. 408—59 3 Claims



1. A spindle for a glass drilling unit comprising:

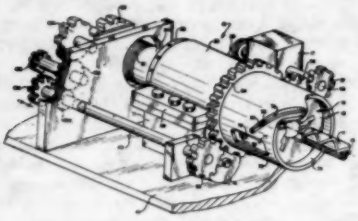
a body member;

means adapted for removably coupling said body member with a deck of the glass drilling unit;

shaft means adapted for receiving and rotating a drill, said shaft means adapted to be removably, rotatably coupled with a gear train of the drilling unit; and

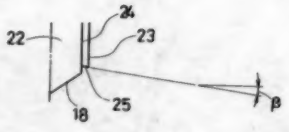
means adapted for providing a collant to a workpiece, said means for providing a collant attached to said spindle.

4,934,639
THREAD CUTTING DEVICE
Bruce A. Washington, Twinsburg, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Division of Ser. No. 847,728, Apr. 3, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 212,074
Int. Cl.[5] B23G 1/22
U.S. Cl. 408—176 5 Claims



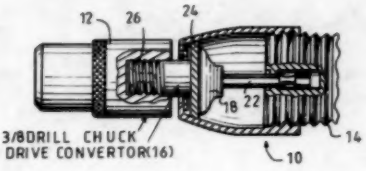
1. A machine for threading a body comprising a frame, a head for supporting a thread forming tool, means for supporting the head relative to the frame for rotation and feeding movement along the axis of such rotation, an interengaged screw and nut each rotatably supported on the frame, the screw and nut including means for feeding the head axially relative to the frame at a rate proportional to the difference in rotational speed between the screw and nut, power drive means on the frame for separately rotating the screw and nut at different speeds, and means to retract said tool radially at a rate proportional to the axial movement between said head and said frame.

4,944,640
VERTICAL FEED TYPE BURNISHING DRILL
Yasuhiro Suzuki, Nagoya; Tuguo Yoshikawa, Okazaki; Kazuhiro Shibata, Kazuhiro; Akio Fukui, Toyohashi, and Kiyotaka Shiga, Okazaki, all of Japan, assignors to Aisan kogyo Corporation, Obbu and Fuji Seiko Corporation, Toyota, both of, Japan
Filed Sep. 7, 1989, Ser. No. 404,354
Claims priority, application Japan, Jan. 10, 1989, 1-1490[U]
Int. Cl.[5] B23B 51/02
U.S. Cl. 408—211 3 Claims



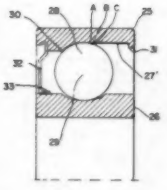
1. A vertical feed type burnishing drill comprising:
a shank;
a cylindrical drill body connected at one end with said shank, the opposite end of said drill body being formed with a reduced-diameter portion having its external diameter smaller than the maximum external diameter of said drill body;
first cutting edge means being formed to extend diametrically in said reduced-diameter portion, extending radially outward from the center of the forward end of said reduced diameter portion, and inclining axially in the rearward direction with a first cutting angle; and
second cutting edge means being formed substantially perpendicular to said first cutting edge means, extending radially outward from a position inward of the outermost peripheral wall of said first cutting edge means, and inclining axially in the forward direction with a second cutting angle.

4,944,641
CLUTCH ENGAGER SLEEVE
Andre Alves, 1429 Shore Pkwy., Brooklyn, N.Y. 11214
Filed Aug. 2, 1989, Ser. No. 392,723
Int. Cl.[5] B23B 51/12
U.S. Cl. 408—239 A 7 Claims



1. A clutch engager sleeve for a drill gun having a forward mode and a reverse mode, comprising:
a drive converter capable of receiving a reverse lock down screw;
a drill chuck having a cavity, said drill chuck being secured to said drive converter;
a clutch engager adjacent said drive converter, said clutch engager providing pressure for a forward mode and a reverse mode;
a shank extending from said clutch engager, said shank being capable of engagement with a screw gun; and,
a lock down collar for securing said shank and applying pressure to said clutch engager in the forward mode and the reverse mode.

4,944,642
BEARING ARRANGEMENT IN ROTARY MACHINES
Börje Andersson, Husvägen, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden
Filed Apr. 27, 1989, Ser. No. 344,221
Claims priority, application Sweden, May 11, 1988, 8801787
Int. Cl.[5] B23B 45/16
U.S. Cl. 408—241 R 7 Claims



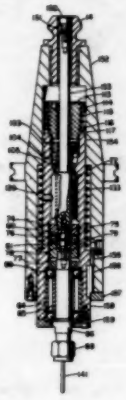
1. A hammer drill mechanism comprising an elongated shaft adapted to carry a tool at one end, means rotatably supporting the shaft in a housing, means mounting the shaft in the housing for limited reciprocatory movement, said mounting means comprising at least one ball bearing having an outer race ring securely fitted in the housing and an inner race ring securely fitted on the shaft, means defining confronting raceways for the balls, at least one of said raceways having a cylindrical portion formed as an extension of the raceway permitting back and forth axial movement of the balls relative to the raceways when the mechanism is functioning as a hammer drill.

4,944,643

TORQUE THRUST AND SURFACE SENSING DEVICE

Robert A. Lehmkuhl, 72 Carpenters Ridge, Cincinnati, Ohio 45241

Filed May 8, 1989, Ser. No. 348,772
Int. Cl.[5] B23B 49/00
U.S. Cl. 409—80 12 Claims



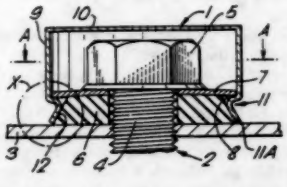
1. A tooling device for computer numerically controlled machining centers having a spindle, a control rod passing through said spindle, a sliding element, said control rod connected to said sliding element, means connected to said sliding element to control position, a spring loaded telescoping tool holder, an actuating rod in said tool holder adapted to engage said control rod, said actuating rod displacing said control rod to displace said sliding element and electronic coupling means to the axis feed rate of the computer numerical control for controlling spindle deceleration from rapid traverse to zero traverse, a means for producing a signal to transmit work surface location to the computer numerical control to feed the spindle to a programmed depth at a programmed feed rate, said telescoping tool holder having a presetable spring loaded thrust unit arranged to permit further telescoping of said tool holder if tool cutting thrust exceeds preset amount further displacing said actuating rod, before programmed depth is reached signalling said computer numerical control that excessive thrust has been reached.

4,944,644

SCREW FASTENER CAP

Alan Bell, Glasgow, Scotland, assignor to Steelpress (Supplies) Limited, Glasgow, Scotland

Filed Oct. 13, 1987, Ser. No. 106,689
Claims priority, application United Kingdom, Oct. 11, 1986, 8624427; Dec. 31, 1986, 8631093
Int. Cl.[5] F16B 19/00, 33/00, 43/00
U.S. Cl. 411—372 13 Claims



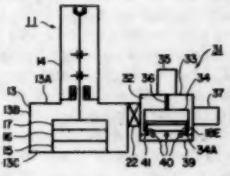
1. A cover cap fitting to a screw fastener device which device comprises a fastener element including a threaded shank and a head part, first washer means located under the head part; and a resilient second-washer located below the first washer means; said cover cap comprising a cap member for location over said head part of the screw fastener element, said cap member including a closed top and an annular wall for location around said washer means, and indent means arranged around the periphery of said annular wall, said indent means being arranged for location below the first washer means to secure the cover cap in position on the screw fastener device, said annular wall including a peripheral skirt below said indent means for engagement with a peripheral portion of said resilient second-washer, the lower edge of said peripheral skirt being located above the level of the bottom edge of the uncompressed resilient second-washer, when the cap cover is fitted to a said screw fastener device.

4,944,645

METHOD AND APPARATUS FOR LOADING OBJECTS INTO EVACUATED TREATING CHAMBER

Akira Suzuki, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 850,226, Apr. 10, 1986, abandoned. This application Jan. 11, 1989, Ser. No. 296,277
Claims priority, application Japan, Apr. 16, 1985, 60-81080
Int. Cl.[5] H01L 21/30
U.S. Cl. 414—217 9 Claims



1. Apparatus for loading an article to be treated into an evacuated treating casing, said article being depicted with a circuit pattern in said treating casing with an electron beam at a predetermined temperature, comprising:

a sealable chamber communicating with said evacuated treating casing;

a magazine disposed in said sealable chamber for supporting said article which has been preadjusted to a temperature substantially equal to said predetermined temperature;

temperature adjusting means disposed in said sealable chamber such that said temperature adjusting means can contact directly with a surface of a holder supporting said article for adjusting temperature of said article to said predetermined temperature in order to compensate for a temperature variation of said article caused by adiabatic expansion of gas exhausted from said sealable chamber;

means for loading said article whose temperature has been adjusted to said a predetermined temperature by said temperature adjusting means into said treating casing; and

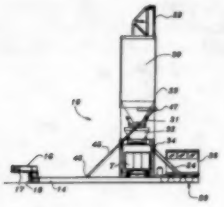
a plurality of holders contained in said magazine, each holder supporting an article, and an elevator means for successively bringing one of said holders to a predetermined level.

4,944,646

HIGHWAY TRANSPORTABLE MATERIAL STORAGE APPARATUS AND FRAME ASSEMBLY THEREFOR

M. Earl Edwards, Hixon, Tenn., and James G. May, Rising Fawn, Ga., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Jan. 12, 1989, Ser. No. 296,491
Int. Cl.[5] B65G 69/00
U.S. Cl. 414—332 11 Claims



1. A frame assembly for a highway transportable material storage apparatus or the like, and which is characterized by the ability to permit the frame assembly to be lowered into ground engaging contact so as to provide a foundation pad for the material storage apparatus during use thereof, said frame assembly comprising

an elongate main frame including a pair of parallel opposite side beams which define a longitudinal direction and front and rear end portions of said frame assembly,

a supporting gridwork mounted to said main frame at said rear end portion thereof and comprising a plurality of longitudinally spaced apart transverse beams extending transversely between said opposite side beams, a pair of longitudinal beams positioned parallel to said side beams and extending between a pair of said transverse beams and so that said side beams and said pair of transverse beams define a rectangular opening which is divided by said longitudinal beams into a central area and opposite outer areas, said gridwork further comprising at least one support beam extending transversely between said pair of longitudinal beams,

wheeled ground engaging carriage means including a pair of longitudinal arms, means pivotally mounting one end of each of said arms to respective ones of said longitudinal beams for pivotal movement about a common horizontal transverse axis, a transverse strut extending transversely between and interconnecting said arms, with said transverse strut being located generally below said one transverse support beam and at a medial location along the length of said longitudinal arms, an axle extending transversely between and mounted to the other end of each of said arms, a pair of road engaging wheel assemblies mounted to respective opposite ends of said axle and such that each wheel assembly is positioned within a respective one of said opposite outer areas of said rectangular opening, and air bag suspension means disposed between said transverse strut and said one transverse support beam, and

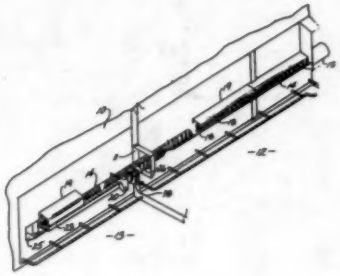
air control means for selectively supplying air to said air bag suspension means so as to pivot said carriage means about said transverse axis to a lower ground engaging position when said air bag suspension means is filled, and exhausting air from said air bag suspension means and so that said carriage means pivots about said transverse axis to a raised position with respect to said main frame and said main frame is lowered to engage and rest upon the ground.

4,944,647

BOTTLE CUTTING AND EMPTYING MACHINE

John C. Oleson, South Pasadena; Steven K. Teske, Moreno Valley; Richard F. Iturzaeta, Moorpark, and Erwin E. Langer, Rancho Cucamonga, all of Calif., assignors to Alpha Therapeutic Corporation, Los Angeles, Calif.

Filed Apr. 29, 1988, Ser. No. 187,818
Int. Cl.[5] B65B 3/04
U.S. Cl. 414—412 25 Claims



1. A machine for cutting and emptying plastic bottles comprising:

a feed screw for conveying bottles through the machine;

a support screw parallel to the feed screw for supporting the bottles in an erect orientation and preventing collapse of the bottles;

a stationary knife with a fixed horizontal cutting edge above the screws and aligned with the erect bottles below the top for cutting caps off the bottles; and

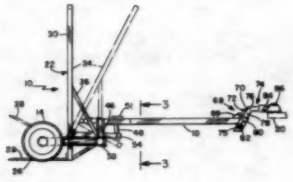
guide means along the feed screw downstream from the knife and downstream from the support screw for at least partly inverting the bottles while in the feed screw and emptying the contents of the bottles.

4,944,648

TRAILER ASSEMBLY

Willard J. Parr, 230 S. West St., Yerrington, Nev. 89477

Filed Jun. 8, 1989, Ser. No. 363,279
Int. Cl.[5] B60D 1/16
U.S. Cl. 414—483 17 Claims



1. A trailer assembly for transporting a load behind a vehicle comprising:

a wheel assembly comprising spaced wheels and an axle connecting the wheels;

an elongate tow bar assembly projecting forwardly from the wheel assembly and including securing means at its forward end for securing said assembly to the towing point of a vehicle;

a load supporting frame pivotally secured to the wheel assembly for movement between a ground position in which the frame is subtantially vertical, a first towing position in which the frame is inclined forwardly of said vertical position, and a second, flat towing position in

which the frame projects horizontally from the wheel assembly in the same direction as said tow bar assembly to form a flat bed trailer;

power means for moving said frame between said ground and said first positions; and

a first releasable latch for releasably latching said frame in said first towing position.

4,944,649

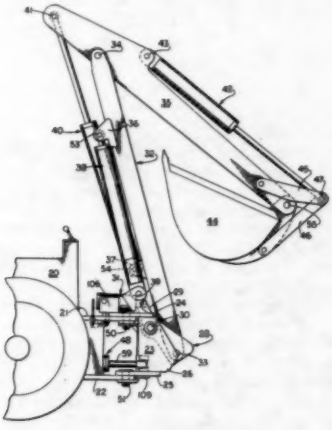
MECHANISM FOR COUPLING SUBORDINATE MACHINE TO TRACTOR

Cecil J. Stralow, 14672 Brookstone Dr., Poway, Calif. 92064

Continuation-in-part of Ser. No. 143,016, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 887,811, Jul. 21, 1986, Pat. No. 4,720,234. This application Apr. 19, 1989, Ser. No. 339,934

Int. Cl.[5] E02F *3/32*

U.S. Cl. 414—686 **9 Claims**



3. In a position control and transport mechamism for use in coupling a subordinate machine to a tractor, the combination of:

a swing tower,

means secured to the tractor for mounting the swing tower for movement in azimuth,

actuating means intercoupling said tractor and tower for swinging the tower,

a pair of spaced side members and a hub secured therebetween to form a rigid rocker distinct from the machine, said rocker having a pivot point in its midsection and spaced formations for coupling it to the machine,

pin means for swingably mounting the rocker for rotary movement in elevation on said tower between lift and working positions, said pin means projecting through said hub and being journaled on said tower so as to provide a single horizontal axis transverse to the longitudinal axis of the mechanism for the swinging movement of the rocker and machine,

rocker-actuating means mounted on the tower and intercoupling the tower and the rocker for driving the rocker in elevation, and

a hydraulic motor carried by said rocker and disposed between the spaced side members of said rocker, the motor including a power takeoff shaft directed toward the machine and transverse to said horizontal axis so that the power takeoff follows the angular movements of the machine in elevation and swings along with it in azimuth.

4,944,650

APPARATUS FOR DETECTING AND CENTERING WAFER

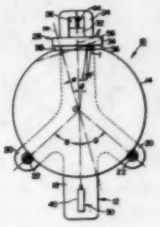
Tatsumi Matsumoto, Nagareyama, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,726

Claims priority, application Japan, Nov. 2, 1987, 62-277896

Int. Cl.[5] B65J *1/00*

U.S. Cl. 414—757 **5 Claims**



1. An apparatus for detecting an orientation flat of a wafer and centering said wafer, comprising:

a hand base operable to be located in opposed relation to one of opposite faces of said wafer, said hand base having first and second ends and an axis along the hand base, and including a guide frame formed at the first end of the hand base and defining a first guide means extending along said axis;

a pair of second guide means mounted on said hand base for supporting said wafer located in opposed relation to said hand base, and second guide means being symmetrically disposed with respect to said axis of said hand base;

stopper means mounted on said hand base for cooperating with said pair of second guide means to center said wafer, said stopper means being accommodated in said first guide means for sliding movement therealong and along said axis of said hand base and engageable with said orientation flat of said wafer; and

urging means connected between said guide frame and said stopper means for urging said stopper means in a direction away from the second end of said hand base;

wherein said stopper means comprises a stopper member having a reference face adapted to be held in contact with the orientation flat of said wafer, and drive means connected to said stopper member for moving said stopper member toward and away from said wafer.

4,944,651

COMPONENT CARRYING APPARATUS AND METHOD

William D. Bogar, 80 Cambridge St., Burlington, Mass. 01803

Filed Jan. 29, 1985, Ser. No. 696,062

Int. Cl.[5] B23P *19/04*

U.S. Cl. 414—787 **4 Claims**

1. Apparatus for carrying components having leads comprising,

a base plate,

a matrix of supporting platforms on said base plate,

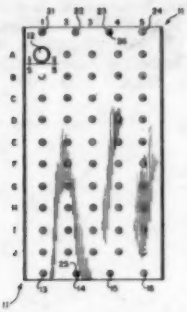
each of said platforms being dimensioned to support a component in a region between the component leads with the component leads above said base plate,

said base plate also carrying end support means for supporting cover means,

said cover means being releasably supported on said end support means at a height above said platforms corresponding substantially to the distance between a platform and the top of a component supported thereon,

whereby an assembly comprising said base plate, said matrix of platforms and said components supported thereon and said cover means may be inverted, said base plate re-

moved from said cover means and said components rest on the inside of said cover means inverted with leads



upstanding in substantially the same relationship to one another while supported on said matrix of platforms prior to inversion.

4,944,652

PROCESS AND DEVICE FOR THE CONTROL OF TURBO COMPRESSORS

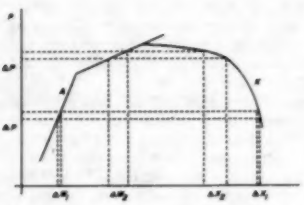
Wilfried Blotenberg, DinsLaken, Fed. Rep. of Germany, assignor to MAN Gutehoffnungshütte GmbH, Oberhausen, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,638

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805119

Int. Cl.[5] F04D *27/02*

U.S. Cl. 415—27 **7 Claims**



1. A method for controlling a turbocompressor to avoid turbocompressor surge comprising the steps of: determining a characteristic curve including non-linear characteristics of the turbocompressor based on two turbocompressor variables, such as discharge pressure and volumetric rate of flow; forming a blow-off line based on the same two turbocompressor variables, such as discharge pressure and volumetric rate of flow; during operation, continuously measuring one of the two variables as a controlled variable, such as volumetric rate of flow and continuously measuring the other variable as the command variable, such as discharge pressure, the measured command variable and measured controlled variable defining the position of the turbocompressor working point with respect to the characteristic curve and the blow-off curve; determining a set value of the controlled variable on the blow-off curve corresponding to the measured command variable; generating a controller output for operating a blow-off valve based on the difference between the measured value and the set value of the controlled variable; and, changing the gain of the turbocompressor control depending upon the nonlinear characteristics of the turbocompressor characteristic curve at the working point so that the influence of the gradient nonlinear characteristics of the turbocompressor characteristic curve on the overall gain on the control loop is substantially compensated.

4,944,653

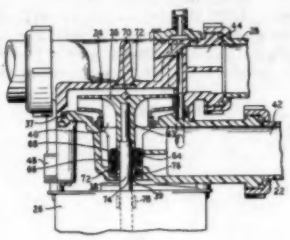
PLASTIC CENTRIFUGAL PUMP

Robert D. Wilkes, Little Rock, Ark., assignor to Jacuzzi, Inc., Little Rock, Ark.

Filed Mar. 24, 1988, Ser. No. 172,577

Int. Cl.[5] F04D *29/08*

U.S. Cl. 415—174.3 **7 Claims**



1. A centrifugal pump comprising:

a pump housing enclosing a rotatable impeller driven by a shaft of a motor, said housing having an opening therethrough for passage of said shaft, said impeller being axially movable on said shaft;

a seal interposed between said impeller and said opening, said seal being interposed adjacent an intake area of said impeller, said seal comprising a first part rotatable with said impeller and a second part fixed to said housing at said opening, said two parts defining an engagement surface therebetween, said seal being compressible between said impeller and said housing, said seal having a resiliency sufficient to move said impeller away from said opening during no-load conditions;

said impeller being oriented on said shaft such that said intake area faces said seal so that said engagement force increases as the load condition of the pump increases; and

bearing means between said impeller and said housing on an opposite side of said impeller from said opening to limit movement of said impeller away from said opening and to facilitate rotation of said impeller, said bearing means comprising a spherical member held on said impeller and a plate secured to said housing engageable by said spherical member upon sufficient movement of said impeller away from said opening.

4,944,654

SPLIT SCROLL FOR CENTRIFUGAL BLOWER

S.-T. Rudy Chou, Liverpool, and Mark R. Hogan, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

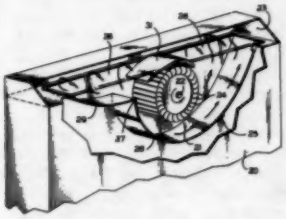
Filed May 15, 1989, Ser. No. 351,597

Int. Cl.[5] F04D *29/44*

U.S. Cl. 415—211.2 **11 Claims**

1. A centrifugal blower assembly comprising a centrifugal fan rotor having an axis of rotation, a circular cross section of a predetermined diameter and a plurality of vanes spaced about its circumference for blowing air centrifugally, said air exiting the fan rotor at an airflow tangent at a predetermined angle from the circumference of the rotor; and a scroll air guide to direct air exiting the rotor to an exit plane to one side of the rotor from whence the air enters an external environment, said scroll air guide including a first curved wall section having a radius from the fan rotor axis which increases monotonically in the fan rotation direction from a predetermined cutoff point closest to the rotor circumference and toward the exit plane, a second curved wall section extending from the cutoff point

towards the exit plane in the direction against rotation, said first and second curved wall sections being substantially mirror images of one another about a plane corresponding to the airflow tangent that passes through said cutoff point; and a



curved cover over substantially all of that part of the circumference of the fan rotor that is at said exit plane, the cover blocking any noise from the fan rotor from radiating directly out into the external environment.

4,944,655

PROPELLER BLADE OF A FIBER-REINFORCED PLASTIC MATERIAL

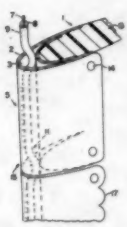
Herbert Merz, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Munich GmbH, Fed. Rep. of Germany

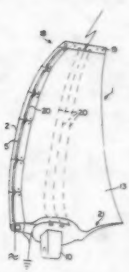
Filed May 8, 1989, Ser. No. 348,878

Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3815906

Int. Cl.[5] B63H *1/00, 3/00, 5/00, 7/00*

U.S. Cl. 416—61 **20 Claims**





1. Propeller blade having a blade span and positioned at a propeller blade hub including metallic parts, the propeller blade comprising:

a fiber reinforced plastic airfoil section;

an outer shroud constructed from a thermally and electrically conductive, deformable material forming a leading edge of the plastic airfoil section;

cavity means formed by the plastic airfoil section and outer shroud, the cavity means separating the outer shroud and the plastic airfoil section of the blade and extending in a direction of the blade span of the propeller blade;

electrical deicing means within the cavity means and in thermal and electrical contact with the outer shroud, the electrical deicing means including a heating conductor and grounding means for electrically grounding the outer shroud;

lightning protection means comprising the outer shroud and the grounding means of the electrical deicing means as lightening conductors; and

connecting means for connecting the lightening protection means to the metallic parts of the propeller blade hub.

4,944,656

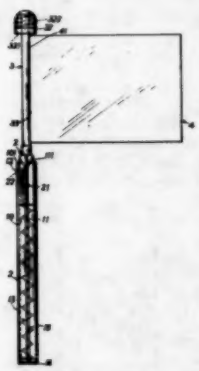
TELESCOPIC ROD MEANS HAVING ROTATABLY RETRACTABLE DISPLAY SHEET

Ou-Yang Feng, and Ou-Yang C. Ho, both of P.O. Box 10160, Taipei, Taiwan

Filed Jan. 27, 1989, Ser. No. 302,665

Int. Cl.[5] G09F *17/00*

U.S. Cl. 116—173 **7 Claims**



1. A telescopic rod means comprising:

a hollow handle having a longitudinal slit formed therein as cut from a top edge of the handle, a longitudinal cylindrical hole formed in the handle, an upper side window formed on an upper portion of the handle, a lower side window formed on a lower portion of the handle and vertically aligned with said upper side window, a bottom cap sealing a bottom hole of the handle, and a helical spring retained inside the bottom cap; an alignment coupler generally formed as a cylindrical sleeve slidably movable inside said longitudinal hole in the handle, said coupler having an inner through hole formed therein, a longitudinal extension formed on the coupler slidably engages the longitudinal slit of said handle, a spring hook plate which is secured to a lower portion of the coupler having a portion which protrudes radially outwardly from the corner for operatively engaging said upper side window or engaging said lower side window of said handle, said coupler further including a truncated tube section fixed to a middle portion of the inner through hole of said coupler having an upper inclined surface tapered upwardly and having a central through hole formed therein said coupler being resiliently biased toward one end of

said longitudinal hole of said handle by said helical spring; and

a reel pole having a top knob formd on its top end, a display sheet having an inner side edge of the sheet secured within a longitudinal slit formed in said pole, a lower portion of said reel pole having a lower inclined surface tapered downwardly and rotatably engageable with said upper inclined surface of said tube section of said coupler, said reel pole including a tail rod protruding downwardly from said lower inclined-surface portion of said pole and having an end hook portion formed on a bottom end of said tail rod, said tail rod extending through said central through hole of said tube section, said reel pole having its lower portion depressible rotated within the inner through hole in said coupler,

whereby initial depression of the top knob toward said handle rotates the lower inclined-surface portion of said pole into tangential engagement with said upper inclined surface of said tube section of said coupler, the pole and the display sheet are thereby rotated to align said display sheet with said longitudinal slit of said handle and further downward depression of the knob causing said spring hook plate to be disengaged from said upper side window and engage said lower side window for a quick retraction of said pole into said hollow handle so that said sheet can be wound around said pole in said handle by rotating said top knob; and upon a depression of said spring hook plate to disengage said hook plate from said lower side window, said helical spring in said handle will restore and extend said coupler and said pole coupled to said coupler upwardly until said spring hook plate engages said upper side window.

4,944,657

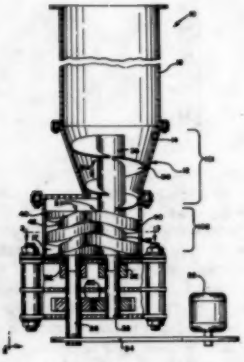
TWO-STAGE PUMPING APPARATUS WITH LOW SHEAR FIRST STAGE

John C. Mowli, 640 Sanders Ct., Gurnee, Ill. 60031

Filed Mar. 1, 1989, Ser. No. 317,460

Int. Cl.[5] F04B *25/14*; F01C *1/16*; A22C *11/02*

U.S. Cl. 417—203 **21 Claims**



1. A two-stage pumping apparatus comprising:

a pump housing through which material is pumped, said housing defining (1) a material infeed opening, (2) a first stage non-positive displacement pumping region communicating with said infeed opening, (3) a second stage positive displacement pumping region downstream of, and communicating with, said first stage region, and (4) at least one material discharge opening communicating with said second stage region;

a first stage auger means in the form of a single rotor in said first stage region rotatable about an axis for moving material along said first stage auger means and having non-positive displacement helical flight means configured around said first stage auger means axis for providing non-positive displacement pumping and a net positive suction head at the interface of said first and second stage regions;

a pair of second stage positive displacement auger means extending in said second stage region rotatable together about respective parallel axes for moving said material along said second stage auger means from said first stage region downstream to said material discharge opening, each of said second stage auger means having positive displacement helical flight means configured for engaging said material and for being respectively intermeshed with the positive displacement helical flight means of the other one of said second stage auger means for providing positive displacement pumping;

said first stage auger means single rotor being parallel to or coaxial with one of said second stage auger means; and

drive means for rotatably driving said pair of second stage auger means and said first stage auger means.

4,944,658

LUBRICATION PUMP WITH AN ADJUSTABLE METERING DEVICE

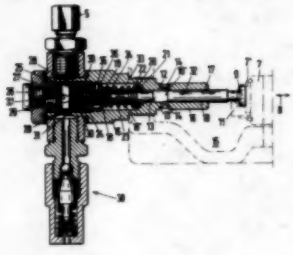
Willibald Büttner, Kirchenthumbach, Fed. Rep. of Germany, assignor to Baier & Köppel GmbH & Co., Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,357

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3818802

Int. Cl.[5] F04B *49/08*

U.S. Cl. 417—274 **9 Claims**



1. A lubrication pump with regulatable metering of an amount of lubricant delivered with each stroke of the pump, comprising:

a suction space having an adjustable volume;

a delivery piston actuatable in a stroking manner by the pump so as to aspirate the lubricant into the suction space;

means for feeding the lubricant from the suction space through an intermediate storage space to one of a lubricant outlet and a lubrication circulation circuit;

a longitudinally displaceable regulating member provided so as to limit the suction space in a delivery direction of the lubricant, regulation of a quantity of lubricant delivered upon each stroke occurring by longitudinal displacement of the regulating member;

a housing provided so as to surround the regulating member, the housing having lateral bores for passing the lubricant from the intermediate storage space to the suction space; and

a check valve provided in the delivery path of the lubricant, the check valve, when viewed in the delivery direction of the lubricant, being located following the suction space and upstream of the intermediate storage space, the check valve having an annularly shaped sealing surface arranged

so as to surround the regulating member and rest at a sealing surface of the housing in a closed position.

4,944,659

IMPLANTABLE PIEZOELECTRIC PUMP SYSTEM

Jean-Marie Labbe; Eduard H. J. Damhuis, both of Bousval, Belgium, and Robert E. L. Cox, Le Pecq, France, assignors to KabiVitrum AB, Stockhol, Sweden

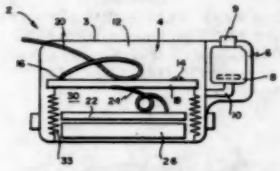
PCT No. PCT/EP88/00062, § 371 Date Nov. 22, 1988, § 102(e) Date Nov. 22, 1988, PCT Pub. No. WO88/05314, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 27, 1988, Ser. No. 282,131

Claims priority, application United Kingdom, Jan. 27, 1988, 8701731

Int. Cl.[5] A61M *1/00*; F04B *17/00*

U.S. Cl. 417—322 **9 Claims**



1. A dispensing device, comprising:

a housing forming a reservoir for fluid to be dispensed and a pump for dispensing the fluid located within the reservoir;

said pump including a pump chamber, a movable pump element and a piezoelectric element, said pump element being physically contiguous with and directly coupled to said piezoelectric element whereby changes in dimension of said piezoelectric element induce pumping movement in the movable pump element;

a source of electrical power connected to a control means for cyclically applying electrical voltage to said piezoelectric element for inducing periodic changes in dimension in said piezoelectric element;

a first one-way valve member bing directly connected between the fluid reservoir and the pump chamber for permitting flow of a fluid from said reservoir into said pump chamber upon movememt of the pump element and a second one-way valve member connected between the pump chamber and an outlet for dispensing said fluid from said pump chamber; and

means for maintaining the pressure of the fluid in the reservoir as the fluid is being dispensed, said pressure maintaining means including an expandable member having one end connected to said pump which closes a space defined by said expandable member.

4,944,660

EMBEDDED NUT COMPRESSOR WHEEL

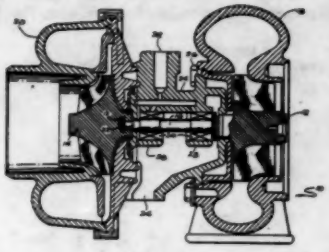
Fidel M. Joco, Long Beach, Calif., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 14, 1987, Ser. No. 96,566

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—407 **16 Claims**

1. A compressor wheel for rotation about an axis of rotation including a hub defining said axis of rotation, said hub including a pair of ends, a radially projecting portion between said ends, said radially projecting portion defining a transverse plane between said ends, and a pair of radially tapering surfaces extending between said radially projecting portion toward a corresponding ones of said ends, aerodynamic blade means carried on the surface extending between said radially projecting portion and one end of the hub, the other surface terminating in a boss portion extending to the other end of said hub, said boss defining a blind bore therein extending from said other end of the hub toward said transverse plane defined by the radially projecting portion but terminating in an end surface located between said other end of the hub and said transverse plane, and a retaining member carried in said boss portion between said other end of the hub and the end surface of the blind bore for engagement with a supporting shaft, said retaining member defining an aperture coaxial with said blind bore for engagement by said shaft.



4,944,661

ELECTRO-MAGNET ACTUATED FUEL PISTON PUMP

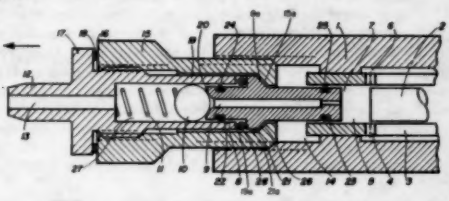
Wolfgang Mayer, Esslingen, Fed. Rep. of Germany, assignor to J. Eberspächer, Esslingen, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,682

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707764

Int. Cl.[5] F02M *59/46*; F04B *17/04*

U.S. Cl. 417—501 **8 Claims**



1. An electromagnetic actuated fuel piston pump for heating equipment which operates on liquid fuel, comprising: a housing defining a cylinder space and defining a valve space; an electromagnetically reciprocating piston movable in said cylinder space; a seating member arranged within said housing in alignment with said cylinder space, said seating member having a delivery bore therethrough extending from a first end adjacent said cylinder space to a second end in said valve space, said valve space and said seating member including means for restricting movement of said seating member in the direction of said piston; a spring-loaded pressure valve engageable with a valve seat of said seating member; a pressure pipe joint forming an extension of said housing, said pressure pipe joint including an annular neck extending into said housing surrounding said spring-loaded pressure valve; a first sealing element for sealing in between a surface defining said cylinder space and said seating member adjacent said seating member first end; a second sealing element for sealing between said annular neck and said seating member adjacent said seating member second end, and elastic means positioned between a shoulder of said seating member and a sleeve edge of said annular neck of for reducing noise generated during pumping.

4,944,662

REVERSIBLE GEROTER PUMP WITH PIVOTING CARRIER UNIDIRECTIONAL FLOW

Robin E. Child, Leamington Spa, Great Britain, assignor to Concentric Pumps Limited, Birmingham, Great Britain

Filed Feb. 16, 1989, Ser. No. 311,937

Claims priority, application United Kingdom, Feb. 26, 1988, 8804582

Int. Cl.[5] F04C *2/10, 15/02*

U.S. Cl. 418—32 **5 Claims**

1. A reversible unidirectional gerotor pump comprising:
(a) an inner male toothed rotor;
(b) a female lobed annulus;
(c) a reversing ring or carrier;
(d) a pump body;
the rotor being located in the female lobed annulus,
wherein the annulus meshes with the rotor, the annulus rotates about an axis which is eccentrically related to the rotor axis, and the annulus is located in the reversing ring or carrier,
the reversing ring or carrier being located in the pump body, and
the axis of the annulus being moveable between a pair of operative positions in one of which liquid is pumped in a pre-determined direction during rotation of the rotor and annulus in one direction and in the second position at which liquid is pumped in the same direction during rotation of the rotor and annulus in the opposite direction,
the reversing ring or carrier being shaped externally relative to the body of the pump so that it can pivot about a pivot means within the body of the pump to translate the annulus from one operative position to the other, to thereby move from one side of the body to the other side of the body,
the carrier being free to move in a direction perpendicular to a line joining the axis of the annulus in the two positions,
the pivot means comprising an elongated slot cooperating with a pivot pin, and
the annulus being externally cylindrical and journalled in an internally cylindrical bore in the carrier.

4,944,663

ROTARY COMPRESSOR HAVING OXIDIZING AND NITRIDING SURFACE TREATMENT

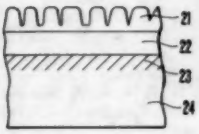
Tadashi Iizuka, Ashikaga; Kazushi Fukuda, Tochigi; Shin Ishihara, Kasukabe; Yasuo Kamitsuma, Mito, and Yusaku Nakagawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1989, Ser. No. 340,289

Int. Cl.[5] F04C *18/356*

U.S. Cl. 418—178 **15 Claims**

1. A compressor including a cylinder, a roller disposed therein in an eccentric relationship thereto, a crankshaft for rotating said roller in said cylinder and a vane disposed in sliding engagement with said roller, at least one of said cylinder, said roller, said crankshaft and said vane comprising a member which is made from a ferrous substantially non-porous material and which has a surface disposed in relative sliding engagement with an associated member, said surface comprising a first porous layer of oxidized iron backed up by a second



layer of oxidized and nitrided iron disposed inwardly of said first layer.

4,944,664

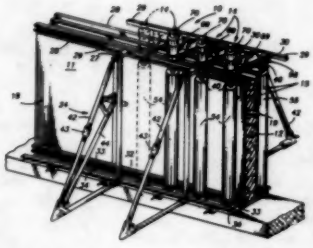
CONCRETE WALL FORM APPARATUS

Cecil F. Allred, 1307 Oak, Othello, Wash. 99344

Filed Sep. 19, 1989, Ser. No. 409,389

Int. Cl.[5] E04G *11/34, 17/00*

U.S. Cl. 425—63 **26 Claims**



1. A concrete wall form apparatus for supporting sheet forms to prevent buckling or bulging of the forms while concrete is being poured between the sheet forms in a progressive formation of an elongated concrete wall along a predetermined path including a corner, the sheet forms having opposed outwardly facing surfaces and inwardly facing surfaces spaced apart to determine a finished wall thickness, comprising:
a pair of upright form engaging rollers, one for the outwardly facing surface of each form;
a carriage frame mounting the rollers for rotation against the outwardly facing surfaces in opposed relation across the wall thickness;
guide tracks mountable to the sheet forms and operatively engaging the form engaging rollers to guide the rollers along the predetermined path and along the outwardly facing surfaces of the sheet forms;
drive gears on the carriage frame in meshing engagement across the frame and interconnected with the rollers so that rotation of any one of the drive gears will cause corresponding counter rotation of the rollers against the outer surfaces of the sheet forms, thereby influencing movement of the apparatus along the predetermined path;
a drive motor on the carriage and connected to the drive gears for selectively rotating the drive gears; and
a clutch interposed between at least one of said rollers and the drive gears, selectively operable as the apparatus encounters a corner along the predetermined path to disengage the one roller from the drive gears and thereby enable the one roller to freewheel while the remaining roller continues to rotate and move about the corner responsive to continued operation of the drive gears and drive motor.

4,944,665

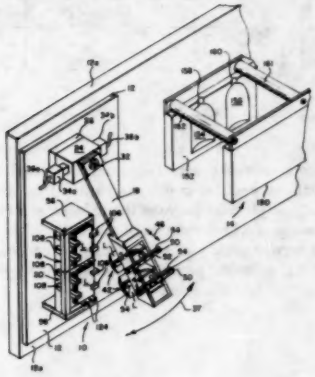
ROTARY ARM LABEL TRANSFER APPARATUS IN COMBINATION WITH MOLDING APPARATUS

Siegfried C. Hasl, 80 Liberty Corner, Warren, N.J. 07060, and Charles J. Lisnet, Westport, Conn., assignors to Siegfried C. Hasl, Warren, N.J.

Continuation of Ser. No. 594,885, Mar. 23, 1984, abandoned, which is a continuation-in-part of Ser. No. 544,986, Oct. 24, 1983, abandoned. This application Nov. 29, 1989, Ser. No. 443,014

Int. Cl.[5] B29C *49/24*

U.S. Cl. 425—116 14 Claims



1. An apparatus comprising, in combination:

a stationary base,

a radial arm mounted to the base, means for pivoting said arm about an axis which is fixed with respect to the base, said arm being pivotally movable about said fixed pivot axis between a first radial position and a second radial position, said two positions defining a plane,

a molding apparatus mounted on the base and comprising opposed mould cavities which move, relative to each other, in a direction substantially perpendicular to said plane against each other to form a closed mould cavity and away from each other to open the mould cavity,

and a label transfer means mounted on said arm and movable therewith for picking up a label at said first position, for retaining said label during transport to said second position and for depositing the label into the mould cavity at said second position, said label transfer means comprising at least one label transfer head, mounting means for mounting said label transfer head on the arm for reciprocal movement in a direction substantially perpendicular to said plane, such that the label transfer head moves substantially perpendicular to said plane at the first position to pick up a label and substantially perpendicular to said plane at the mould cavity to deposit the label into said mould cavity.

4,944,666

INJECTOR HEAD FOR PRODUCING TREAD STRIPS

Rainer Hilke, Starnberg, and Gerhard Schmaderer, Cham, both of Fed. Rep. of Germany, assignors to A-Z Foremen- und Maschinenbau GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 18, 1989, Ser. No. 395,938

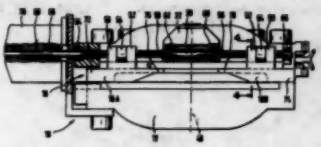
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1988, 8810470[U]

Int. Cl.[5] B29C *47/16*

U.S. Cl. 425—131.1 16 Claims

1. In an injector head for producing extruded tread strips for tires, including a thickness-adjusting slide means and two side plates to form an essentially extruded trapezoidal tread strip profile, the improvement comprising:

means for mounting said side plates in such a way that said side plates are adjustable in a lateral direction, at right angles to a direction of extrusion, and are supported against said thickness-adjusting slide means in a direction



parallel to said direction of extrusion, with said thickness-adjusting slide means, on a short side of said trapezoid, extending over the entire tread strip width; and

an end member that is mounted on said injector head in such a way that it can swivel, one of said thickness-adjusting slide means and said two side parts being mounted on said end member.

4,944,667

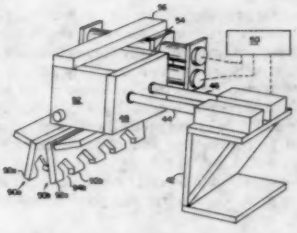
APPARATUS FOR REMOVING FLASHING FROM BOTTLES

Thomas F. Greene, 2 Harrison Eaton La., Amesbury, Mass. 01913

Filed May 15, 1989, Ser. No. 351,950

Int. Cl.[5] B29C *49/72*

U.S. Cl. 425—317 7 Claims



1. An apparatus for removing flashing from bottles which comprises:

a clamping assembly having opposed jaws including means to reciprocate the jaws between an open position and a closed position;

means to close the jaws to grippingly engage the flashing;

means to rotate the jaws while in gripping engagement with the flashing to remove the flashing while the flashing is clamped;

means to open the jaws to release the flashing therefrom;

a housing assembly having opposed walls, one wall having recesses therein in register with similar recesses within the other wall, the recesses defining nests when in a closed position;

means to move the housing assembly into alignment with the clamping assembly; and

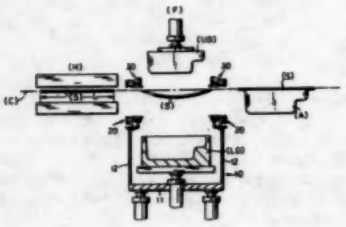
means to move the walls of the housing assembly to a closed position to nest the bottles therein, and to maintain the walls in a closed position while the flashing is being removed and the nests stabilizing the bottle while the flashing is removed therefrom.

4,944,668

DEVICE FOR GRIPPING AND PULLING SOFTENED PLASTIC SHEET AT FRONT AND REAR EDGES TO BE MOLDINGLY FORMED

Kazuo Asano; Toshihiso Takai, and Mitsuake Takito, all of Nagoya, Japan, assignors to Kabushiki Kaisha Asano Kenkyusho, Aichi, Japan

Filed Jan. 26, 1989, Ser. No. 301,771
Claims priority, application Japan, Feb. 24, 1988, 63-41669
Int. Cl.[5] B29C *51/04*
U.S. Cl. 425—397 **6 Claims**



1. A device for gripping a length of thermally softened and inevitably dangled plastic sheet, said sheet brought in position in a forming machine by feeding means while holding concaved front and rear edges of said plastic sheet to be pulled for straightening, said device comprising; at least two pairs of lower and upper gripping members arranged below and above front and rear edges of said plastic sheet; means for vertically moving each pair of said gripping members towards each other for gripping said plastic sheet and pulling apart from each other for releasing said sheet, each of said pair of gripping members comprising;

a body portion,

a gripping tip provided at one end of said body portion,

a longitudinally extended pull lever and a longitudinally extended pivot lever pivotally connected with each other,

a sleeve pivotally mounted on said body portion at an opposite end thereof and fitted with said pivot lever at said opposite end portion and slidingly movable therein,

a pair of parallel link arms pivotally mounted at said one end on said pull lever and said opposite end on said body portion, and

spring means mounted on said pivot lever as to urge the pull lever to protrude at a free end portion beyond said gripping tip and

each of said pair of gripping members being arranged symmetrical with respect to each other so that opposite gripping tips are normally separated to form an opening therebetween through which said pull levers normally separated are protruded and so that when said means for vertically moving moves said pair of gripping members towards each other said pull levers are firstly engaged to grip an edge of the plastic sheet therebetween at the free end portion and concurrently retracted against a force of said spring means for pulling to straighten the concaved edge and then the gripping tips are engaged to further grip the edge of the plastic sheet.

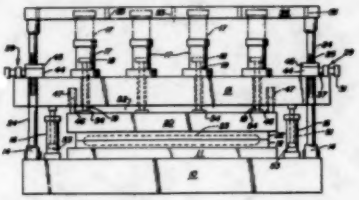
4,944,669

HIGH TONNAGE RIM PRESS

Paul Zakich, Akron, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1989, Ser. No. 318,574
Int. Cl.[5] B29C *45/03*
U.S. Cl. 425—589 **16 Claims**

1. A RIM press comprising a pair of mold plates movable with respect to each other to a clamping position, each plate providing one of a pair of mold parts cooperable to interfit and comprise a mold having a sealed reaction injection mold cavity therebetween when said plates are clamped toward each other at said clamping position, a carrier associated with one of said plates and movable with respect thereto to a locking position adjacent to said one plate at said clamping position, means operative for blocking movement of said carrier from said locking position force exerting means carried by said carrier for forcing said one plate toward said other plate at said clamping position comprising a plurality of connectors extensible independently of each other in the direction from said carrier toward said one plate for pressing thereagainst at a plurality of separate locations within the area of said mold when the latter is clamped between said plates, and means independent of said force exerting means for moving said mold plates with respect to each other to said clamping position.

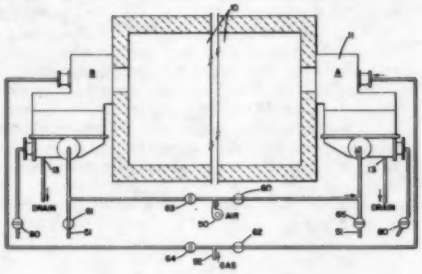


4,944,670

SELF-CLEANING BURNER

James E. Watson, Southgate, Mich., assignor to North American Manufacturing Co., Cleveland, Ohio

Filed Dec. 15, 1989, Ser. No. 451,784
Int. Cl.[5] F23D *11/44*
U.S. Cl. 431—166 **7 Claims**



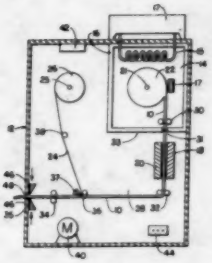
1. In a burner having a regenerative bed, which regenerative bed is prone to the solidification of contaminants from the material being heated within the furnace due to the existence within the regenerative bed of bed media having a temperature lower than the solidifying temperature of such contaminant material, the improvement comprising means to heat the bed media in the regenerative bed to above the solidifying temperature of the contaminants such that the contaminants are unsolidified and means to drain off the unsolidified contaminants from the regenerative bed.

4,944,671

METHOD AND APPARATUS FOR STORING AND DISPENSING ENVIRONMENTALLY SENSITIVE MATERIALS

Marion G. Vohland; Edwin M. Odom, and Herbert H. Harris, Jr., all of Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Jul. 25, 1988, Ser. No. 223,506
Int. Cl.[5] F27B 9/25
U.S. Cl. 432—8 11 Claims



1. Apparatus for storing and dispensing an environmentally sensitive material, said apparatus comprising:

a housing;

a storage chamber in said housing;

means for controlling the environmental conditions within said storage chamber;

at least one conditioning chamber in said housing;

conditioning means in said conditioning chamber;

means for advancing said material along a predetermined path from said storage chamber through said conditioning chamber;

said means for controlling the environmental conditions in said storage chamber including means for maintaining said storage chamber at a temperature to retard chemical cross-linking of said composite material; said conditioning means including means in said conditioning chamber for heating said composite material.

first dispensing means positioned in said path for dispensing said material from said storage chamber into said conditioning chamber; and

second dispensing means positioned in said path for dispensing said material from said conditioning chamber to the outside of said housing.

4,944,672

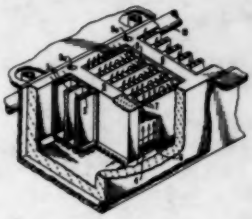
METHOD FOR RENOVATING RING CHAMBER FURNACES

Hogne Linga, and Carlo Eliassen, both of Årdalstangen, Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Feb. 8, 1989, Ser. No. 310,833
Claims priority, application Norway, Feb. 8, 1988, 880532
Int. Cl.[5] F27B 5/02, 5/16
U.S. Cl. 432—3 6 Claims

1. A method of renovating a ring section furnace, said furnace having a plurality of sections each of which alterntes between a heating cycle and an inactive period, and said furnace normally operating with a number of said sections in said heating cycle, said sections in said heating cycle being substantially grouped to define a plurality of firing zones separated by the remaining ones of said sections which are in said inactive period, said sections defining each said firing zone beginning and ending their respective heating cycle at staggered intervals whereby said firing zones remain discrete and progress through said plurality of sections, said method comprising the steps of:

altering the duration of said firing cycle for less than all of said firing zones, whereby the number of said sections in said inactive period which border at least one of said firing zones increases at one end of said at least one of said firing zones; and



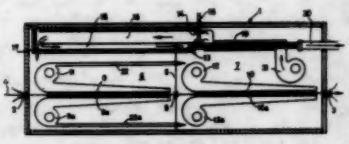
performing renovation work on at least one of said sections in said inactive period which borders said at least one of said firing zones at said one end thereof.

4,944,673

DRIER FOR A WEB OF MATERIAL

Thomas G. M. Jacobs, Boxmeer, and Clemens J. M. De Vroome, Beugen, both of Netherlands, assignors to Stork Contiweb B.V., Netherlands

Filed Jan. 27, 1989, Ser. No. 303,485
Claims priority, application Netherlands, Jan. 29, 1988, 8800226
Int. Cl.[5] F27B 9/28
U.S. Cl. 432—59 9 Claims



1. A drier for a web, said drier comprising:

an essentially closed housing, said housing including an inlet through which the web enters said housing and an outlet through which the web exits said housing;

a heating section for heating the web, said heating section being located within said housing;

an evaporating section for evaporating material from the web after the web is heated by said heating section, said evaporating section being located within said housing;

a partition for separating said evaporating section from said heating section so that substantially no evaporation occurs within said heating section, said partition including an opening for transferring air directly from said heating section to said evaporating section to maintain the temperature within said evaporating section at a first temperature; and

a heating appliance, including:

(a) an incinerator for incinerating the evaporated material and for generating hot combustion gases;

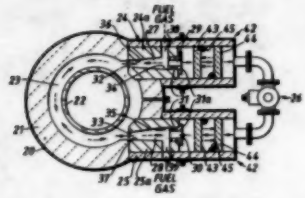
(b) an intake for transferring the evaporated material from said evaporating section to said incinerator; and

(c) a discharge opening for discharging at least a portion of the hot combustion gases to said heating section to maintain the temperature within said heating section at a second temperature which is greater than the first temperature.

4,944,674
APPARATUS FOR HEATING A VESSEL

Philip J. Wedge, Solihull, and David Wharmby, Birmingham, both of England, assignors to British Gas plc, London, England

Filed Nov. 13, 1989, Ser. No. 434,782
Int. Cl.[5] F27B *14/00*
U.S. Cl. 432—158 14 Claims

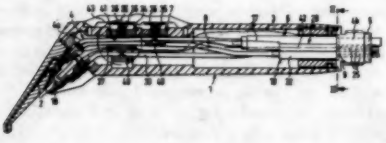


1. Apparatus for heating a vessel comprising an enclosure to surround said vessel, a reversing burner system having at least first and second burners for operating alternately as firing burners or as flues for hot combustion product gases, said enclosure being spaced from said vessel so that a flow path exists between the enclosure and vessel, said flow path being for receiving the hot combustion product gases discharged into the flow path from said firing burners, said flow path being adjacent to the exterior of the vessel and extending completely around said vessel for allowing circulation and re-circulation of the hot combustion product gases, and the first and second burners being in positions for causing the hot combustion product gases from the first burner to flow in one direction along the flow path when the second burner is operating as a said flue in one cycle of operation of the burners and for causing the hot combustion product gases from the second burner to flow in the opposite direction along the flow path when the first burner is operating as a said flue in the alternate cycle of operation.

4,944,675
DENTAL SPRAY HANDPIECE

Gerd Löhn, Biberach/Rissegg, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,891
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734831
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—32 22 Claims

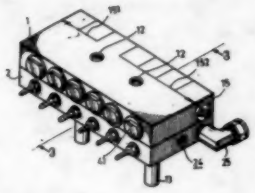


1. Dental spray handpiece comprising a gripping sleeve having a media inlet connection at one end and a media discharge outlet; a media conduit in said sleeve leading from the media inlet connections to the media discharge outlet and discharging outwardly therefrom; electrical heating means for heating media and a shut-off valve which is movable into an open position by finger-actuation, said shut-off valve being associated with said media conduit and a branch line branching off from said media conduit downstream of said shut-off valve, said branch line leading to a pressure-responsive electric switch for closing a previously interrupted electrical current circuit which is connected with said heating means responsive to a pressure force.

4,944,676
REPLACEABLE FLUID FLOW CONTROL DEVICE FOR DENTAL UNITS

Chien-Hsiung Hu, No. 3-1, Alley 8, Lane 906, Minsheng E. Rd., Taipei, Taiwan

Filed Feb. 10, 1989, Ser. No. 308,611
Int. Cl.[5] A61C *1/02*
U.S. Cl. 433—98 5 Claims



1. A replaceable fluid flow control means for dental units, comprising a first means and a second means which are engaged together by at least two screws;

said first means having a plurality of cylindrical bores which extend lengthwise through lateral sides of said first means; each of said bores having first, second, and third portions of different radii; said first portion receiving a first spring, a valve control sealing ring and a first cap; said third portion for receiving a second spring and a second cap; and said second portion for receiving a valve body disposed between said first and second springs; a number of said third portions of adjacent said bores being intercommunicated to one another by a respective fluid-supply channel from each end side of said first means;

a first supply hole being provided on lower surface of said first means communicating with said fluid-supply channel; a first air-input hole communicating with said first portion of each said bore; a first air-output hole proximate to said first portion and a first access hole proximate to said third portion being provided thereof communicating with said second portion of each said bore;

a second supply hole, air-input hole, air-output hole and access hole being provided on an upper surface of said second means, and respectively corresponding to said first supply hole, first air-input hole, first air-output hole and first access hole for each said bore; a sealing ring being provided on an uppermost end of all holes on said second means to prevent leakage between said first and second means;

a connector being provided on each end side of said second means to communicate with said second supply hole for fluid input; all of said second air-output holes being intercommunicated by a second channel extending lengthwise all the way through said end sides of said second means;

a plurality of input ports being provided on a lateral side of said second means to communicate with said respective second air-input holes for compressed air input to actuate said valve body; a plurality of output ports being provided on a second lateral side of said second means to communicate with said respective second access holes for fluid output; and

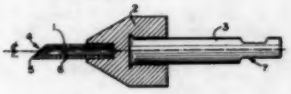
said compressed air causing said valve control sealing ring to actuate said valve body; a movement of said valve body making said first channel communicate with said first access hole to output fluid supplied from said respective connector.

4,944,677

INTRAOSSEUS DENTAL ANESTHESIA APPARATUS AND METHOD

Raymond J. Alexandre, 18, Rue Lamartine, Fort de France 97200 Martinique, France, assignor to Raymond Joseph Alexandre, Martinique, France and Richard P. Masel, Newton, N.J.

Filed Jun. 29, 1987, Ser. No. 67,153
Int. Cl.[5] A61C *3/02*
U.S. Cl. 433—165 **12 Claims**



1. An apparatus for enabling the intraosseous injection of dental anesthesia comprising:

means for drilling a hole in a jawbone comprising a hollow needle of from about 25 to 35 gauge having a drilling end with a substantially smooth and uniform cylindrical surface and a beveled tip and attached end, said bevelled tip being formed by a single planar cut through said hollow needle at an angle of 15 to 75 degrees to the longitudinal axis of said hollow needle;

a connecting flange to which the fastened end of said drilling means is permanently fastened; and

a mandrel lying on a common axis with said drilling means, having a free end adapted for engagement with a dental handpiece and a fastened end which is permanently or removably fastened to said connecting flange, projecting in a direction opposite to said drilling means.

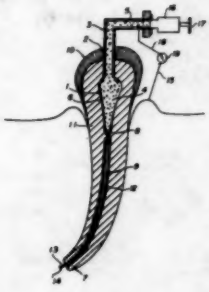
11. A mandrel comprising a rod of 10 to 25 mm length with a diameter of about 1.5 to 2.5 mm having at one end thereof an annular mandrel collar threadably engaged with a cuplike hub having affixed thereto a disposable 25 to 35 gauge dental needle about 4 to 12 mm in length, said needle being hollow and having a bevelled tip formed by a single planar cut through said needle at an angle of 15 to 75 degrees to the longitudinal axis of the needle.

4,944,678

PROCESS AND APPARATUS FOR DEVITALIZATION OF A TOOTH

Alain Villette, St. Pierre des Echaubrognes, France, assignor to Bristol-Myers-Squibb Company, New York, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,122
Int. Cl.[5] A61C *5/02*
U.S. Cl. 433—224 **18 Claims**



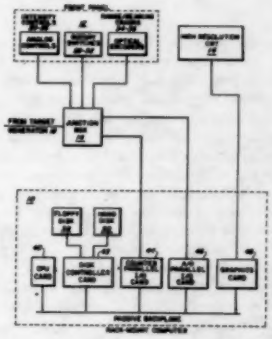
1. An apparatus for devitalization of a tooth by obduration comprising a cannula which is adapted to be inserted into an orifice in the crown section of a tooth such that said cannula is removably retained within said orifice and enters and terminates at the pulp cavity of said tooth and an injector means, said injector means being adapted to inject an inert paste into said cavity and a means to terminate the pressure on the inert paste whenever a predetermined pressure is reached during injection and a means to monitor the level of paste inside the tooth during the injection process, said injector means being adapted to inject an inert paste into a tooth such that said paste compresses the pulp tissue of said tooth against the dentin wall and eliminates tissue fluids in the pulp.

4,944,679

GENERIC RADAR DISPLAY

John H. Allen, and Robert S. Reif, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1989, Ser. No. 416,201
Int. Cl.[5] G09B *9/00*; G01S *7/40*
U.S. Cl. 434—2 **9 Claims**



1. Radar simulation apparatus comprising a microprocessor system having an input subsystem for receiving the output stream of data from a target generator, and having an output subsystem capable of displaying a simulated radar return image, and being adapted to interact with said target generator and process its output, including timing means responsive to said stream from said target generator for initiating said processing a preselected period after an interruption of said data that exceeds a predetermined rate for packets of said data, assembly means responsive to target coordinate data for converting it to a predetermined coordinate system that is compatible with said output subsystem and assembling the converted target data in digital storage by age such that each target has at least one digital bit that correlates to a position on the predetermined coordinate system including an index that correlates to the time relative to other targets that the target data was received by the system, decay means responsive to the relative age of the stored coordinates and including a preselected color table having a relationship to said index, for rotating the color table in coordination with said rate such that the color related to said index changes from one color to another and will progressively appear less bright on said output subsystem each time said table is rotated, and presentation means responsive to said stored coordinates and said decay means for providing a signal to said output subsystem that denotes the coordinates of the targets in storage and their relative intensities by age, said microprocessor means comprising a general purpose computer adapted by software, and wherein said timing means, said assembly means, said decay means and said presentation means are adjustable by software modification for use of said system with a plurality of target generators.

4,944,680

ARTIFICIAL DENTURE-SKULL FOR DENTAL PURPOSES

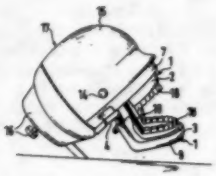
Hans-Walter Lang, Leutkirch, and Alfred Straka, Isny, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voight GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,397

Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3816006

Int. Cl.[5] A61C *19/00*

U.S. Cl. 434—264 4 Claims



1. Artificial denture-skull for dental teaching and practice, including an upper jaw model and a lower jaw model; jaw linkage means connecting said lower jaw model for pivotal movement with said upper jaw model, said jaw linkages being arranged at both sides of the jaw models; and latching means for fixing the denture-skull in an open position being arranged on said upper jaw model, said latching means extending downwardly and being engageable with said lower jaw model, said latching means including a mounting block fixed on said upper jaw model and latching struts each extending from said mounting blocks, said mounting block positioned adjacent said jaw linkage means; wherein said mounting block is positioned on said upper jaw model within the plane of said upper jaw model, and said latching struts extend from said mounting block in a plane parallel to and adjacent to the plane of said jaw linkages so as to maintain an unobstructed rear view of said upper and lower jaw models.

4,944,681

PLUSH TOY WITH EAR SYSTEM FOR DISPLAYING NORMAL AND ABNORMAL EARDRUMS

Paul A. Burgio, 4279 Brigadoon, Shoreview, Minn. 55126, and C. Randall Nelms, Jr., 15 Ridge Rd., N. Oaks, St. Paul, Minn. 55127

Filed Jan. 11, 1989, Ser. No. 296,082

Int. Cl.[5] G09B *23/28*

U.S. Cl. 434—270 1 Claim

1. A simulator unit for use in learning about ear conditions, comprising:

an animal-like plush toy having a head portion, said head portion having ear openings defined therein;

an elongate tube member in said head portion having an inner space defined therein;

a first opening in one end of said elongate tube member which is adapted to receive an otoscope, said first opening being substantially aligned with and in communication with one of said ear openings; a second opening in the other end of said elongate tube member, said second opening being substantially aligned with and in communication with another of said ear openings;

means for positioning a photographic slide within the inner space defined in said elongate tube member; and

means on an opposite side of said positioning means from said first opening for providing illumination said illumination means comprising membrane means positioned between said positioning means and said second opening; whereby images of normal or diseased ears may be viewed through an otoscope by placing an appropriate slide in said positioning means and by inserting the otoscope into said first opening.

4,944,682

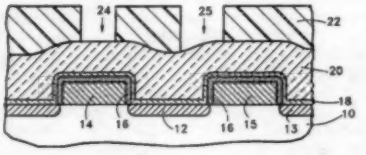
METHOD OF FORMING BORDERLESS CONTACTS

John E. Cronin; Susan F. Cronin, both of Georgia; Carter W. Kaanta, Colchester; Charles W. Koburger, III, Essex; Stephen E. Luce, Cambridge, all of Vt., and Dale J. Pearson, Carmel, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 254,633, Oct. 7, 1988, abandoned. This application Dec. 21, 1989, Ser. No. 453,368

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—192 10 Claims



1. In the process of forming semiconductor components on a substrate material, and wherein there are at least two exposed regions having an overlying passivating material which is subject to etching by a given etchant, the improvement comprising; selectively depositing in at least a portion of a selected one but less than all of said exposed regions a material that resists said etchant, and thereafter exposing all of the regions to said etchant, whereby only said regions without said etch resisting material will be etched.

4,944,683

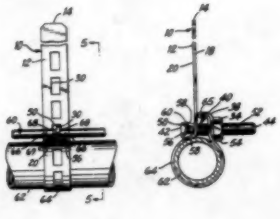
GROUNDING CLAMP

Ignazio E. Leonardo, Union, N.J., assignor to A K Stamping Co., Inc., Mountainside, N.J.

Filed Nov. 13, 1989, Ser. No. 435,337

Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—96 18 Claims



1. A grounding clamp for connecting and clamping a selected ground conductor to a grounding member, the selected ground conductor having a particular size selected from a

range of sizes capable of being accommodated in the grounding clamp, the grounding clamp comprising:

an elongate strap of electrically conductive material having opposite first and second faces, a length extending longitudinally between opposite first and second ends and including an aperture passing through the strap adjacent the second end of the strap, the aperture having a peripheral configuration along the perimeter thereof, and a plurality of slots passing through the strap and spaced longitudinally along the length of the strap between the aperture and the first end of the strap, each of the slots having a peripheral configuration along the perimeter thereof;

a stud having axially opposite first and second ends and including a head adjacent the first end, and fastener means adjacent the second end, the relative dimensions of the aperture and the fastener means being such that fastener means may be passed through the aperture, and the relative dimensions of each slot and the head being such that the head may be passed through any selected one of the slots; and

a passage extending transversely into the head and having a size great enough to receive the selected ground conductor;

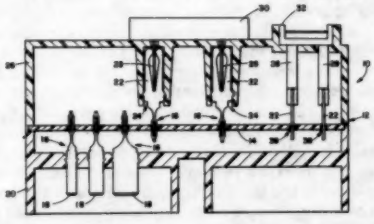
whereby, upon looping at least a segment of the strap around the grounding member and bringing the aperture into juxtaposition with the selected one of the slots, portions of the first face of the strap will confront one another adjacent the looped segment of the strap, and the stud will pass through the aperture and through the selected one of the slots, with the fastener means and the head placed adjacent to and extending axially beyond corresponding portions of the second face of the strap, thereby enabling insertion of the ground conductor into the passage with the ground conductor juxtaposed with the corresponding portion of the second face of the strap and extending transversely beyond the perimeter of the selected one slot so that operation of the fastener means to draw the stud in the direction from the second end toward the first end will tend to close the looped segment of the strap around the grounding member and clamp the ground conductor against the corresponding portion of the second face of the strap in direct electrical contact with the strap.

4,944,684

ELECTRICAL JUNCTION BOX AND METHOD FOR ITS MANUFACTURE

Joseph D. Leibowitz, Culver City, Calif., assignor to TRW, Inc., Cleveland, Ohio

Filed Jun. 28, 1988, Ser. No. 212,966
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—76 **15 Claims**



1. An electrical junction box, comprising:

a housing;

a multilayer circuit board supported by the interior of the housing and having a plurality of layers of circuit traces of varying thicknesses for conducting signals of equally varying current levels, thereby minimizing the amount of metal required to fabricate the junction box; and

an array of electrical connectors supported by the exterior of the housing, each connector making electrical contact with one or more of the circuit traces in the circuit board;

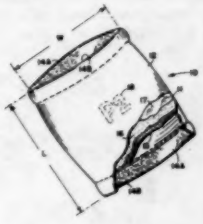
wherein the layers of circuit traces are arranged in the multilayer circuit board according to the thicknesses of the traces, the layers of circuit traces with the greater thicknesses being the outermost layers of the circuit board and the layers of circuit traces with the lesser thicknesses being the innermost layers, thereby enhancing heat dissipation from the circuit board.

4,944,685

CONNECTOR PROTECTOR

Peter G. Schulte, 700 NE. Court, Ft. Lauderdale, Fla. 33334

Filed Nov. 2, 1989, Ser. No. 430,635
Int. Cl.[5] H01R 13/44
U.S. Cl. 439—135 **6 Claims**



1. A protector for a cable connector when said connector is disconnected from its mating connector comprising:

a sleeve formed from a flexible fabric having first and second open ends thereof;

padding material covering inside surfaces of said sleeve;

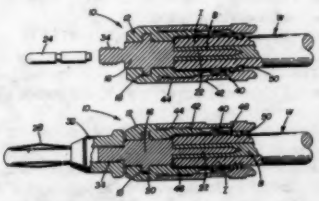
means along the inner edges of said first and second open ends for temporarily closing said open ends wherein said sleeve is to be disposed over a cable having said connector attached at a distal end thereof and said first and second sleeve ends closed around said cable when said connector is attached to a second connector, and, when said connector is disconnected from said second connector, said sleeve encloses said disconnected connector, and said first sleeve end is closed, and said second sleeve end is closed around said cable.

4,944,686

SOLDERLESS ELECTRICAL CONNECTOR

Jonathan Gertz, Lexington, Ky., assignor to Audio Authority Corporation, Lexington, Ky.

Filed May 1, 1989, Ser. No. 345,698
Int. Cl.[5] H01R 11/32
U.S. Cl. 439—175 **14 Claims**



1. A solderless connector for connecting an insulated electrical conductor to an electrical apparatus, comprising:

a body member;

means for connecting said body member to the electrical conductor;

means mounted to said body member for making electrical contact with said electrical conductor;

terminal means mounted to said body member for making electrical contact with said electrical apparatus;

means on said terminal means for mounting an alternative terminal means; and

a weakened zone on said terminal means that is frangible to allow the selective breaking off of said terminal means from said body member and the attachment of an alternative terminal means to said means for mounting.

4,944,687

DEFORMABLE ELECTRICAL CONNECTION SYSTEM

Régis Mailly, Belleneuve; Jean Pierre Thierry, Couternon, and Serge Verdenne, Marcilly S/Tille, all of France, assignors to La Telemecanique Electrique, France

Filed Jan. 30, 1989, Ser. No. 303,894

Claims priority, application France, Feb. 3, 1988, 88 01236

Int. Cl.[5] H01R *35/00*; H02G *15/08*

U.S. Cl. 439—207 **23 Claims**

1. A system for connecting, along a selectable curved path, relatively fixed spaced apart ends of two electrical energy distribution conduits and of respective conductors disposed longitudinally in each conduit, the system comprising an elongated protective casing and a plurality of plastically bendable elongated conductors disposed in mutual insulating relation inside the casing and extending longitudinally side by side in a layer having a width dimension transverse to the length of the casing, the casing and layer of conductors being jointly bendable into a selected curved path about a series of pivot axes substantially parallel to the width dimension of the layer within a certain limited range of curvature within which said bending occurs by plastic deformation of the bendable conductors, and wherein the casing comprises two end elements, each end element being adapted to be connected to an end of a respective one of the two conduits, and a central part connecting the two end elements, the central part comprising a series of links pivotally hinged to each other, the hinges between adjacent links defining said series of pivot axes, the bendable conductors extending successively through the links.

4,944,688

PROGRAMMABLE SEALED CONNECTOR

Robert G. Lundergan, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 25, 1989, Ser. No. 411,933

Int. Cl.[5] H01R *00/00*

U.S. Cl. 439—275 **20 Claims**

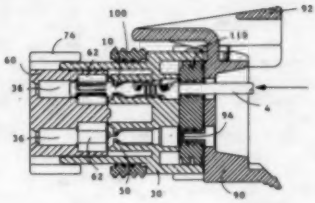
1. A sealed electrical connector for use with a plurality of wires, comprising:

an insulative housing having a plurality of cavities located in an array of terminal positions;

a plurality of terminals located in a least some of the cavities, each terminal including means for termination to a wire;

elastomeric sealing means for establishing a seal around each wire, the sealing means having a plurality of holes located at each terminal position, each hole being aligned with a cavity; and

a plate positioned adjacent the sealing means, the plate initially having a plurality of selectively removable projections in a pattern corresponding to the array of terminal positions, projections corresponding to the locations of terminals terminated to wires extending from the terminals through holes in the elastomeric sealing means having been removed, remaining projections extending through holes in the elastomeric sealing means, aligned with unoccupied terminal positions, to establish a seal at each terminal position in the array.



4,944,689

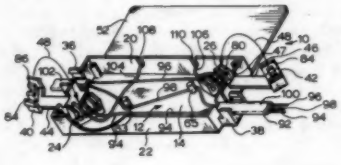
PANEL WIRING CONNECTOR

Owen R. Carr, Vancouver, Canada, assignor to Univ. of British Columbia, Vancouver, Canada

Filed Jul. 13, 1989, Ser. No. 379,209

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—417 **6 Claims**



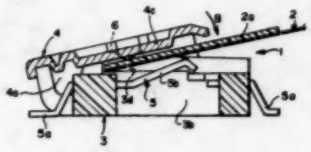
1. A molded junction box for connecting a heating panel to an electric power line, said box comprising an open ended cavity defined by a bottom wall and side walls, a first power line opening through a first one of said side walls, a second power line opening through a second one of said side walls, a first and a second wire clamping means associated with said first and said second power line openings, a pair of wire connectors in said cavity, one of said pair of wire connectors located adjacent said first wall and the other of said pair of wire connectors adjacent said second wall, each of said wire connectors opening toward an open end of said cavity, a cooperating wire connector closure means for each of said wire connectors, each said cooperating connector closure means having a strap integral with and connecting said closure means to its adjacent of said side walls, each said strap positioning its respective said closure means with respect to its respective said wire connector so that each said closure means may be folded into said cavity and into closing relationship with its respective wire connector, a box cover means having snap fastener means positioned to cooperate with mating snap fastener means on said box to lock said cover in a closing position on said box, a mounting flange projecting from one side of said box, a cooperating mounting flange projecting from said box cover means, said flange and said cooperating flange being positioned in spaced parallel relationship when said box cover means is mounted in closing relationship on said box to snugly receive a heating panel to which said box is to be connected between said mounting flange and said cooperating mounting flange.

4,944,690

ELECTRICAL CONNECTOR FOR FLAT ELECTRICAL CABLES

Akira Imai, Kanagawa, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 16, 1988, Ser. No. 272,178
Claims priority, application Japan, Jan. 14, 1988, 63-3778
Int. Cl.[5] H01R 9/07
U.S. Cl. 439—492 **13 Claims**



1. An electrical connector for electrically connecting electrical conductors of a flat cable to a circuit board, the connector comprising:

a dielectric housing having electrical contact members secured therein at spaced intervals corresponding to the spacing of the electrical conductors of the flat cable, said contact members having spring contact sections being within said housing for making electrical connection to the conductors of the flat cable and leg sections extending outwardly from said housing for electrical connection to the conductors of the circuit board;

a cover member pivotally and slidably mounted on said housing for pivoting said cover member between an open position to allow insertion of the flat cable and a closed position to be held in that position by sliding said cover member; and

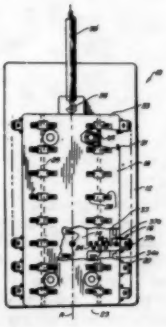
securing members on said cover member extending toward said housing for clampingly engaging the inserted flat cable in the closed position of said cover member.

4,944,691

HOLDER FOR A REMOVABLE CIRCUIT ELEMENT

David R. Marach, Marengo, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 232,322, Aug. 15, 1988, Pat. No. 4,872,262. This application Jul. 19, 1989, Ser. No. 382,096
Int. Cl.[5] H01R 9/28
U.S. Cl. 439—516 **29 Claims**



1. A holder for a removable circuit element having two end terminals, comprising:

(a) an insulated base;

(b) an electrical bus member carried by said base, said bus member comprising a plurality of lateral branches joined to a common trunk, each branch having at its free end one integral terminal for receiving one end terminal of a removable circuit element; and

(c) a plurality of terminal members carried by said base and aligned to said lateral branches, each terminal member having at one end an electrical terminal for an electrical connection thereto and having at an opposite end one integral terminal for receiving one end terminal of a removable circuit element, said one integral terminal being spaced apart from said one integral terminal on an aligned said lateral branch so as to receive a removable circuit element therebetween, said terminal members and said bus member having been formed from the same blank of metal.

4,944,692

ELECTRICAL PLUG-IN CONNECTORS

Edward F. Allina, 605 Capri Blvd., Treasure Island, Fla. 33706

Filed Feb. 24, 1989, Ser. No. 315,559
Int. Cl.[5] H01R 33/945
U.S. Cl. 439—517 **8 Claims**

1. Electrical plug-in connector apparatus, comprising

adjacent first and second electrically conductive jaws oriented generally parallel to one another, and fastened together near one end of each, and biased together near their opposite or free ends;

the first jaw being relatively rigid and having a substantially flat face near its free end adjacent the free end of the second jaw,

the second jaw being S-curved, relatively flexible and having a convex portion near its free end with a substantially flat face adjacent the flat face of the first jaw;

a similarly curved biasing spring fastened to the second jaw and extending along but spaced from the side of the second jaw most remote from the first jaw to the free end of the second jaw, where the free end of the biasing spring becomes contiguous with the second jaw and is thereby adapted to bias its flat face toward the other flat face;

the jaws being so adapted to receive a substantially straight conductive blade in contact therewith between such free ends.

4,944,693

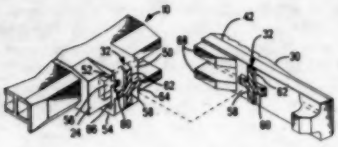
LATCH ARM FOR ELECTRICAL CONNECTOR HOUSING

Dean A. Puerner, Maricopa, Ariz., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 387,203, Jul. 28, 1989, abandoned. This application Nov. 7, 1989, Ser. No. 433,412
Int. Cl.[5] H01R 13/629
U.S. Cl. 439—358 **11 Claims**

1. A hinge joint for joining a deflectable section integrally to a plastic article, comprising a bight section spaced from a surface portion of said plastic article and joined integrally thereto by a pair of leg sections coextending outwardly from said surface portion and spaced apart substantially in parallel to define a relief area therebetween, and a rib section joining said

bight section to said deflectable section and having at least a first rib component joined to said bight section substantially parallel to said leg sections and midway therebetween and extending from proximate a first edge of said bight section to proximate a second edge, whereby upon deflection of said



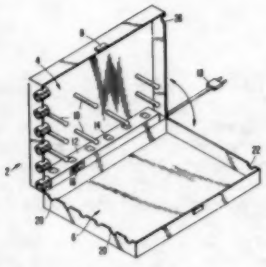
deflectable section relative to said article, said bight section is flexible by being adapted to be locally elastically deformed by said first rib component relatively toward said article surface portion at one of said first and second edge portions and relatively away therefrom at the other of said first and second edge portions.

4,944,694

ELECTRIC CORD TAKE-UP DEVICE

Kevin L. Doru, 4816 South 29th St., Arlington, Va. 22206

Filed Mar. 28, 1989, Ser. No. 329,820
Int. Cl.[5] H01R *13/72*
U.S. Cl. 439—501 **13 Claims**



1. An electric wire take up device, comprising:
a closable container having a top and a bottom;
pegs fixed to the bottom of the container, the pegs being arranged in predetermined geometric patterns;
cut-outs in at least one side of the container; and
an electrical outlet strip in the container, the outlet having a plurality of plugs; and
wire securing means associated with each cutout;
wherein an electric wire introduced into the container through one of the cut-outs can be wrapped about one or more pegs in a unique pattern and its end plugged into the outlet.

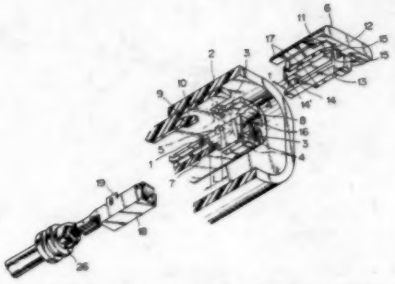
4,944,695

CONNECTOR TERMINAL RETAINING CONSTRUCTION

Masanori Tsuji; Yoshihiro Murakami, and Makoto Yamanashi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433,101
Claims priority, application Japan, Dec. 9, 1988, 63-310115
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—595 **4 Claims**

1. A terminal connector retaining construction comprising:
a connector housing,
a plural number of terminal compartments provided in said connector housing,
a resilient arm and a locking step provided in inner walls of each of said compartment for retaining an inserted terminal, said resilient arm and said locking step being adapted respectively to be pressed against one side of said terminal and to be engaged with the other side of said terminal,
a spacer for pressing sid resilient arm against said terminal, said spacer being adapted to be inserted into said connector housing in the direction opposite to a terminal insertion direction,



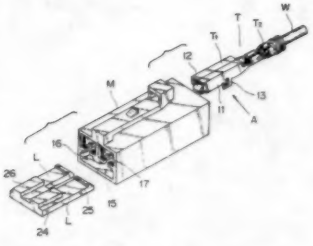
a provisional locking projection and a final locking projection provided on one of the outer wall of said terminal compartment and on said spacer, and
engagement portions formed on one of the other member of said wall portion and of said spacer for engaging with said provisional locking projection and said final locking projection respectively.

4,944,696

ELECTRICAL CONNECTOR APPARATUS

Tadahiro Sueyoshi; Takayuki Yamamoto, and Masanori Tsuji, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 437,725
Claims priority, application Japan, Dec. 19, 1988, 63-318467
Int. Cl.[5] H01R *00/00*
U.S. Cl. 439—595 **6 Claims**



1. An electrical connector apparatus having a terminal accommodation chamber means in an insulated housing equipped with a latching arm means extending in front of an opening and having a terminal latching part, said latching arm means is engaged with a latching part of a terminal when said terminal is inserted in a proper position of said chamber means so as to subsequently prevent inadvertent disengagement of said terminal, characterized in that said electrical connector apparatus includes a deflectable terminal latching plate integrally extending backward from the front of the opening of said terminal accommodation chamber means and being formed with said latching arm means which is extending integrally forward from a free edge part in a back portion of said terminal latching

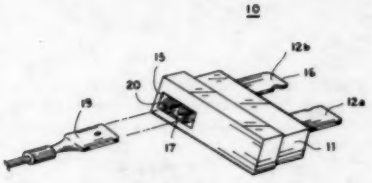
plate, said terminal latching plate also having a latching groove, said terminal having notches apart from said latching part thereof, wherein said notches can be engaged with said latching groove in said proper position.

4,944,697

AUTOMOTIVE FUSE CONNECTOR

Douglas M. Dorman, 3559 Franklin Rd., Roanoke, Va. 24014

Filed Nov. 8, 1989, Ser. No. 433,125
Int. Cl.[5] H01R *13/68*
U.S. Cl. 439—621 2 Claims



1. An automotive fuse that allows connection of external electrical devices, including:

a hollow housing shell having three apertures, two of said apertures being adjacent on one side of said housing shell and the third of said apertures being on the other side of said housing shell opposite one of said other two apertures;

one conventional flat conductive contact disposed in said housing shell and through a first one of said apertures;

a second contact having one conventional flat end and a secondary electrical connector disposed on the other end, said second contact disposed in said housing shell with said one conventional flat end disposed through a second of said apertures adjacent said first one of said apertures, said other end being disposed in said housing shell adjacent said third aperture to allow access for a corresponding electrical connector;

wherein said secondary electrical connector is a female-type connector which is adapted to receive therein a male-type electrical connector blade; and

wherein a current limiter is connected between said first and second contacts in said housing shell, said current limiter breaking the connection between said first and second contacts upon an overload of current.

4,944,698

DUAL MODULAR JACK ADAPTER

John A. Siemon, Watertown, Conn., and Richard Early, San Diego, Calif., assignors to The Siemon Company, Watertown, Conn.

Filed Dec. 27, 1988, Ser. No. 290,033
Int. Cl.[5] H01R *23/02*
U.S. Cl. 439—676 23 Claims

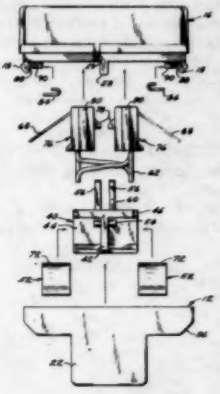
1. A dual modular test adapter which is adapted to electrically and mechanically connect onto two or more parallel columns of terminals extending from a communications terminal block, comprising:

an insulative housing having an interior and an exterior, said housing having at least two parallel and adjacent rows of apertures, said apertures communicating between said housing exterior and said housing interior, each of said apertures leading to a cavity in said housing interior;

a plurality of connector clip means, one each of said clip means being disposed in one each of said cavities, said connector clip means being adapted to effect electrical and mechanical connection with a terminal from a terminal block;

a pair of modular jack means, said pair of modular jack means being retained within said housing and communicating between said housing interior and said housing exterior, said modular jack means having contact pins therein;

a plurality of conductor means in said housing, one each of said conductor means being electrically connected between one each of said connector clip means and one each of said contact pins of said modular jack means; and



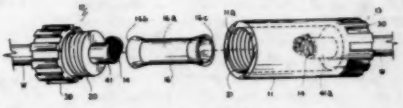
insulating connector clip carrier means, said carrier means being disposed within said housing interior, said carrier means having a plurality of cells which in conjunction with said housing define said cavities for each of said connector clip means.

4,944,699

SPLICING CONNECTOR

David C. Velke, Sr., 3305 Aldie Rd., Catharpin, Va. 22018; George P. Marsden, 7621 Mary Cassatt Dr., Potomac, Md. 20854, and Burton C. Leffingwell, 242 Meadows La., N.E., Leesburg, Va. 22075

Filed Jun. 28, 1989, Ser. No. 372,657
Int. Cl.[5] H01R *4/30*
U.S. Cl. 439—784 2 Claims



1. A connector means for the joining of the free ends of separate wire cables, comprising:

a connector housing having an outer and inner surface,

said connector housing having two opposite ends,

threaded fastener means on one said connector housing end,

said connector housing being substantially hollow throughout its length and defining an interior chamber therein,

a lateral end cap removably attachable to said connector housing by said threaded fastener means,

said connector housing having a fixed housing end cap at its end opposite said end having said threaded fastener means,

said removable lateral end cap and said fixed housing end cap each having a passageway therethrough for receiving the free end of the wire cable,

said removable lateral end cap and said fixed housing end cap each having a cylindrical portion disposed thereon with said removable lateral end cap cylindrical portion insertable within said connector housing interior,

a separate conductive connector member insertable within said connector housing interior,

said conductive connector member having a cylindrical shape and provided with conically shaped flanges at either end thereof, and

said cylindrical portions respectively insertable within said conically shaped flanges at either end of said conductive connector member, whereby

upon insertion of wire cable ends through said lateral end cap and connector housing end cap passageways and movement of said lateral end cap toward said connector housing, the wire cable ends are captively secured between said conductive connector member flanges and said respective cylindrical portions.

4,944,700

ELECTRICAL CONNECTING CLAMP

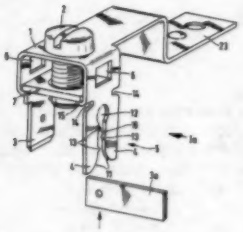
Hans Simon, Bruchausener Strasse, 5463 Unkel/Rhein, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,015

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808197

Int. Cl.[5] H01R *4/34*

U.S. Cl. 439—801 **5 Claims**



1. Electrical connecting clamp, for connecting an electrical conductor to an electrical device such as an electrical connection box or connecting bar for connecting the conductor of a connecting cable to an electrical device, e.g. an electric oven, the connecting clamp having a substantially U-shaped clamping body comprising two parallel arms and a midsection extending therebetween which the conductor is connected by means of a clamping screw on and through said midsection, one said arm of said clamping body ending in at least one insertable blade, characterized in that on the other said arm at least one resilient contact element is formed which differs from said insertable blade, said one resilient contact element including an opening extending in a direction of insertion of an insertable blade, said opening dividing said other arm into two resilient walls each provided with a bevelled lead-in portion, and the opening having a widened part at its end opposite to said lead-in portion to improve resilience.

4,944,701

COAXIAL PLUG-TYPE INNER CONDUCTOR CONNECTION

Georg Spinner, Am Eichberg 12, 8152 Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 319,655

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808632

Int. Cl.[5] H01R *13/17*

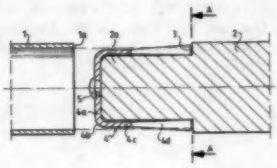
U.S. Cl. 439—827 **15 Claims**

1. A coaxial plug-type inner conductor connection, comprising:

a socket having an inner diameter and defining an end face;

a plug defining a plug axis and having a forward portion of reduced diameter so as to define an annular shoulder providing a stop for said end face of said socket; and

a contact cap surrounding said forward portion of said plug, said contact cap having a base attached to said forward portion at an end face opposing said contact cap and a wall suitably shaped so as to impart a radial resiliency thereto, said wall having at its distal end from said base a greatest outer diameter which exceeds said inner diameter



of said socket and being provided with a plurality of axial slots so as to be subdivided into resilient spring plates, with each individual spring plate being arched transverse to its longitudinal axis so as to define a longitudinal fold which extends parallel to said plug axis.

4,944,702

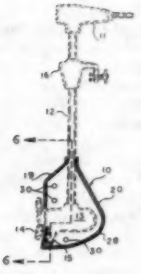
HOUSING RUDDER FOR ELECTRIC TROLLING MOTOR

Alan Cain, Fort Worth, Tex., assignor to Shark-fin Products, Inc., Arlington, Tex.

Filed Apr. 17, 1989, Ser. No. 339,225

Int. Cl.[5] B63H *21/26*

U.S. Cl. 440—51 **5 Claims**



1. In an electric trolling motor of a type having a drive unit and a cylindrical control shaft, a housing device enclosing the drive unit comprising in combination:

(a) a vertical plane of symmetry,

(b) an upper section having top and bottom extremities and opposed sidewalls of large area, the control shaft extending upward from the upper section, the upper section having a leading edge which extends forward of the control shaft and inclines downward at an angle relative to the axis of the control shaft, the upper section having a trailing edge located rearward of the control shaft and extending downward, the distance from the lowermost portion of the trailing edge of the upper section to the lowermost portion of the leading edge of the upper section being substantially greater than the diameter of the control shaft,

(c) a middle section emergent from the bottom extremity of said upper section and closely embracing the drive unit, and

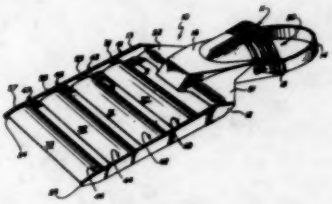
(d) a lower section whose thickness is generally smaller than the thickness of said middle section, and contoured as a guard vane downwardly directed from the underside of said middle section.

4,944,703

SWIM FIN HAVING MULTIPLE ARTICULATING TRANSVERSE HYDROFOIL BLADES

Arthur R. Mosier, 10922 Oak St., No. 216, Los Alamitos, Calif. 90720

Filed Apr. 11, 1988, Ser. No. 180,155
Int. Cl.[5] A63C *31/10*
U.S. Cl. 441—62 **6 Claims**



1. For use in aiding a swimmer or diver, a swim fin comprising:

foot attachment means;

a pair of elongated support beams secured to and extending from said foot attachment means;

a plurality of hydrofoil blades each defining a length, a leading edge, a trailing edge and opposed hydrofoil curved surfaces therebetween wherein said hydrofoil blades each define lengths substantially greater than the distance from their leading edges and trailing edges;

pivotal attachment means coupling said hydrofoil blades to said support beams in a pivotal attachment in which said hydrofoil blades are pivotal through a limited angular range, said pivotal attachment means including spring means operative upon each of said hydrofoil blades biasing said hydrofoil blades to a neutral position in alignment with said elongated beam supports and including pairs of pins extending from said hydrofoil blades defining an axis of rotation therebetween and wherein said axis of rotation is closer to said leading edge than said trailing edge; and

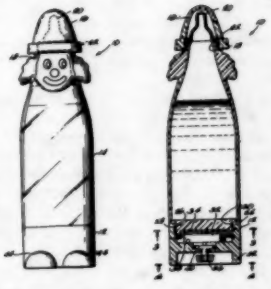
said hydrofoil blades each defining a center of force and wherein said pivotal attachment means are coupled to each of said hydrofoil blades at points offset from said center of force.

4,944,704

TOY-SHAPED MUSICAL NURSER

Carol Grace, 32709 S. Lakeshore Dr., Burlington, Wis. 53105

Filed Dec. 29, 1988, Ser. No. 291,530
Int. Cl.[5] A63H *3/28*; A61J *9/00*
U.S. Cl. 446—74 **6 Claims**



1. A musical nurser comprising:

a bottle portion having an open end adapted to receive thereon a nipple and having a closed end opposite said open end;

a base portion detachably mountable on said closed end of said bottle portion, said base portion including a bottom wall having an aperture therethrough;

a cap portion detachably mountable over said nipple at said open end of said bottle portion;

a music source comprising a wind-up music box fully enclosed within said base portion;

user-actuable means comprising a key for actuating said music source, said key extending through said aperture and including an upper flange of greater dimension than said aperture for preventing complete withdrawal of said key through said bottom wall; and

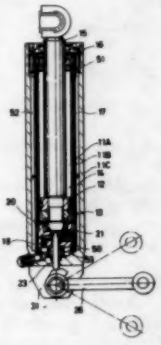
said bottle portion, said base portion and said cap portion each being shaped so as to form, when joined to each other, a unitary structure having a predetermined toy-like shape.

4,944,705

TILT DAMPER

Mitsuhiro Kashima, and Nobumichi Hanawa, both of Kani, Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1988, Ser. No. 256,898
Claims priority, application Japan, Oct. 26, 1987, 62-270027; Nov. 12, 1987, 62-286222; Nov. 12, 1987, 62-286224; Feb. 10, 1988, 63-29667; Apr. 13, 1988, 63-49795[U]; Jun. 7, 1988, 63-75432[U]; Jul. 28, 1988, 63-100001[U]
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—61 **31 Claims**



1. A tilt damper for a propelling device attached to a boat comprising a cylinder means containing a supply of oil, a piston means dividing said cylinder means into a first oil chamber and a second oil chamber and movable in said cylinder means to extend and retract relative to said cylinder means, a gas chamber means containing a pressurized gas, first valve means operable to provide communication between said gas chamber means and said first oil chamber, second valve means operable to provide communication between said first and second oil chamber means, and an operating member movable between a plurality of operable positions for opening said first and second valve means, one of said operable positions being a first operable position which opens said first valve means to provide communication between said gas chamber means and said first oil chamber while said second valve means is closed such that said pressurized gas provides cushioning of said first oil chamber and thereby cushioning of extension of said piston means while precluding retraction of said piston means, another of said operable positions being a second operable position which opens both said first and second valve means to provide communication between said first and second oil chambers and

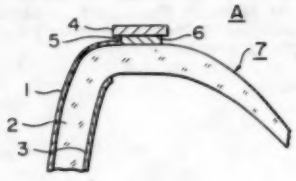
between said gas chamber means and said first and second oil chambers such that the pressurized gas extends said piston means, said operating member having a third operable position in which both said first and second valve means are closed to thereby preclude extension and retraction of said piston means.

4,944,706

CATHODE RAY TUBE AND METHOD OF MAKING THE SAME

Toshio Tojo, Chiba, Japan, assignor to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Ltd., Chiba, both of, Japan

Continuation of Ser. No. 155,061, Feb. 11, 1988, abandoned. This application Jul. 11, 1989, Ser. No. 378,501
Claims priority, application Japan, Mar. 20, 1987, 62-63862
Int. Cl.[5] H01J *9/00*
U.S. Cl. 445—8 **6 Claims**



1. A cathode ray tube comprising:
a bulb body;
a fluorescent screen formed on an inner surface of a panel of said bulb body;
a conductive coating formed on a surface of said panel which is opposite to and substantially parallel to said fluorescent screen;
a metal reinforcement arranged on a front-side wall portion of said bulb body;
an insulating member arranged between said metal reinforcement and said bulb body; and
a conductive material impregnated into said insulating material to establish conduction between said metal reinforcement and said conductive coating.

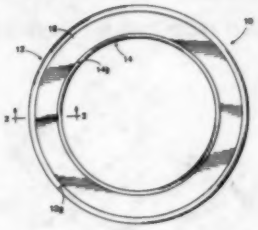
4,944,707

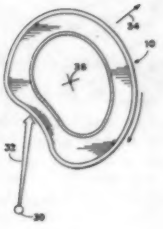
RING-LIKE FLYING TOY

David E. Silverglate, Santa Cruz, Calif., assignor to OddzOn Products, Inc, Campbell, Calif.

Continuation-in-part of Ser. No. 324,986, Mar. 15, 1989, abandoned, which is a continuation of Ser. No. 11,145, Feb. 5, 1987, abandoned. This application Aug. 31, 1989, Ser. No. 400,997
Int. Cl.[5] A63H *27/00*
U.S. Cl. 446—48 **18 Claims**

1. A ring-like flying toy comprising means defining outer and inner, ring-like, generally concentric, deformable boundary structures nominally bounding an annular space, and an





air-foil web joined to and tensed between said structures in said space.

4,944,708

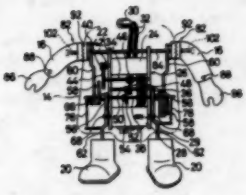
MOVING DOLL TOY

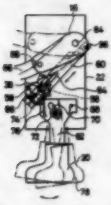
Haruo Kawabe, Misato, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,379
Claims priority, application Japan, Feb. 29, 1988, 63-26354[U]
Int. Cl.[5] A63H *11/18, 30/04*
U.S. Cl. 446—175 **7 Claims**

1. An improved driving structure for use with a moving doll having a body, the body having a left side and a right side, and upon which body a left arm, a right arm, a left leg, and a right leg are pivotally connected, the improvement comprising:
a frame located in the body, the frame having a left side and a right side,
a motor mounted on the frame,
a gear transmission mechanism mounted on the frame and connected to the motor, the gear transmission mechanism having a left side output shaft and a right side output shaft;
a first pair of cam means for providing rotating camming surfaces of a predetermined shape, one of the first cam means being mounted to the left side output shaft and the other of the first cam means being mounted to the right side output shaft;
a first pair of connecting members, each connecting member having an arm side that is connected to one of the arm pairs and a camming side that engages the camming surface of a corresponding one of the first pair of cam means;
a second pair of cam means for providing rotating camming surfaces of a predetermined shape, one of the second cam means being mounted to the left side of the output shaft and the other of the second cam means being mounted to the right side of the output shaft;
a second pair of connecting members, each connecting member having a leg side that is connected to one of the legs and a camming side that engages the camming surface of a corresponding one of the second pair of cam means; and
biasing means, located between the left and right output

shafts and the corresponding camming side of each connecting member, for biasing the camming side of each connecting member against its corresponding cam means





whereby the arms and legs of the moving doll may be moved in a predetermined fashion in accordance with the predetermined shapes of the cam means.

4,944,709

BALLOON SCULPTURING METHODS, APPARATUS AND PRODUCTS

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Division of Ser. No. 183,720, Apr. 19, 1988, Pat. No. 4,850,926.
This application Jun. 21, 1989, Ser. No. 369,634
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] A63H *3/06*; B65D *90/04*
U.S. Cl. 446—221 **6 Claims**

1. The method of forming a balloon sculpture simulating a tree from a plurality of balloons of the type having a constricted neck portion terminating at one end in an inflation aperture and at the other end in an imperforate inflatable sidewall, said method comprising the steps of:

(a) forming a plurality of basic balloon building blocks each including:

(i) a rigid rod-like balloon former having a first end, a second end, and means defining at least one (1) axially extending diametric slot formed in at least one (1) of the first and second former ends; and,

(ii) at least one (1) partially inflated first balloon having its(their) constricted neck portion(s) extending through the slot defining means in the former with at least one (1) of the inflation aperture and/or constricted neck portion of each first balloon being secured to the former, and having the inflated imperforate sidewall of each partially inflated first balloon stretched along the unslotted length of the former and a portion thereof stretched over and about the other of the first and second former ends so as to create a basic balloon building block wherein the former defines a lineal barrier precluding distension of the balloon sidewall juxtaposed therewith in the direction of the former so that each partially inflated balloon has a flat surface abutting the former, tapered pointed upper and lower extremities, and an at least partially ovate configuration in all other planes bisecting the balloon and the former;

(b) establish a vertically upstanding support simulating a tree trunk and having a plurality of radial bores formed therein at diverse axial locations on, and uniformly disposed about, the support with each radial bore being angled downwardly towards the axis of the support; and,

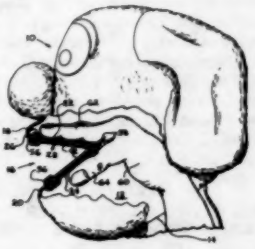
(c) inserting the slotted end of the former in each of the plurality of basic balloon building blocks formed in Step (a) in respective different ones of the radial bores in the upstanding support to simulate the branches of a tree.

4,944,710

PUPPET MOUTH CONSTRUCTION

Valerie D. Semmers, Jackson, Mich., assignor to National Child Safety Council, Jackson, Mich.

Division of Ser. No. 267,321, Nov. 4, 1988, Pat. No. 4,871,341.
This application May 22, 1989, Ser. No. 354,732
Int. Cl.[5] A63J *19/00*
U.S. Cl. 446—329 **6 Claims**

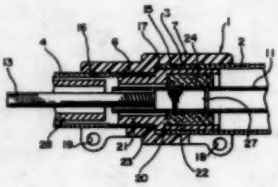


6. A puppet mouth assembly capable of being moved by the fingers for a puppet having a mouth opening defined by upper and lower lip regions, the improvement comprising, a pair of substantially identical base pieces formed of a staff material each having a first and second side located on opposite sides of the associated base piece, an outer lip peripheral region and an inner peripheral region, said base pieces being attached together adjacent said inner peripheral region with said base pieces' first sides in opposed relationship to define a hinge, a first fabric disposed over said first side of each base piece, a second fabric affixed to each of said first fabrics adjacent the common base piece's outer lip region extending over the associated lip region and affixed to the associated base piece's second side, and a mouth plate affixed to said lip peripheral region of each base piece extending inwardly with respect to the mouth opening, said base pieces' second sides each being attached to a mouth plate to close the mouth opening.

4,944,711
EXTENDABLE/RETRACTABLE OPERATIONAL SLEEVE

Yoshiaki Hironaka, Sayama, and Isao Matsumoto, Koganei, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,526
Claims priority, application Japan, Mar. 23, 1988, 63-38212[U]
Int. Cl.[5] F16C 1/06, 1/26
U.S. Cl. 464—52 1 Claim



1. An extendable/retractable operational sleeve comprising a main sleeve portion and a movable sleeve portion which is movable in an axial direction in a telescopic manner relative to said main sleeve portion, characterized in that a front end portion of said main sleeve portion is securedly fixed to a large diameter hole portion of a joint member; a rear end portion of said movable sleeve portion is inserted into a small diameter portion of said joint member; a stop member is fixed to the rear end portion of said movable sleeve portion; said stop member has a large diameter portion that is slidably engaged with said main sleeve portion in the axial direction and a shoulder portion engaged with a step portion at an inner end of the large diameter hole portion of said joint member for limiting outward separation of said movable sleeve portion; said main sleeve portion has therein a tubular transmission shaft rotatably supported by a bearing mounted within said large diameter portion of said stop member; and a movable transmission shaft is supported rotatably within said movable sleeve portion and is movable together with said movable sleeve portion; an inner peripheral portion of said main transmission shaft is in the form of non-circular shape in cross section and a shaft joint member mounted on said movable transmission shaft has a complementary shape with the inner periphery of said main transmission shaft to thereby support said shaft joint member slidably in the axial direction within said main transmission shaft.

4,944,712
SPLIT FLYWHEEL WITH VIBRATION COMPENSATION BETWEEN VEHICLE ENGINE AND DRIVE TRAIN

Günter Wörner, Kernern, and Ernst Tscheplak, Weinstadt, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

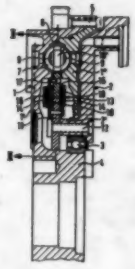
Filed Dec. 23, 1988, Ser. No. 289,033
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743801
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[5] F16D 3/14; F16F 15/12
U.S. Cl. 464—67 17 Claims

1. A split flywheel for driving insertion between an engine and a driving unit, having two equiaxial flywheel elements with essentially apportioned flywheel masses has a spring arrangement means drivingly inserted between the flywheel elements for absorbing vibrations and transmitting power therebetween;

a non-positive coupling means positively connected between an abutment part of the spring arrangement means and one flywheel element for limiting the power transmitted by the spring arrangement means during excessive vibrations and high torque transfers;

said spring arrangement means comprising at least a long-stroke non-prestressed or negligibly prestressed helical spring means which has a helical axis in the form of an arc of a circle, with a center of curvature at the flywheel axis;

the helical spring means, in response to centrifugal force, being operated by an additional friction force against bearing faces arranged on at least one of the abutment part and a flywheel element which supports the helical spring means in a centrifugal radially outwards movement rela-



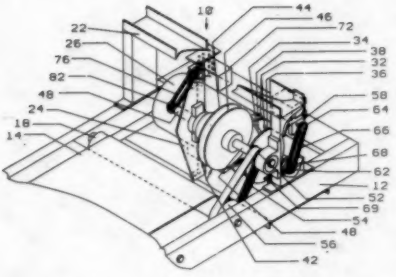
tive to the flywheel axis to stiffen the helical spring means during normal and high engine speeds where the engine normally drives the driven unit to reduce vibration absorption and relative motion between the flywheel elements;

and wherein spring constants of the spring arrangement means are so soft that the vibrations occurring at a low engine speed when the engine is not used to drive the driven unit are in the supercritical range and the helical spring means operates without the additional friction force allowing greater relative motion between the flywheel elements.

4,944,713
TREADMILL SPEED RESET SYSTEM

Mark Salerno, 205 E. Main St., Suite 3-6, Huntington, N.Y. 11743-2923

Filed Oct. 30, 1989, Ser. No. 428,588
Int. Cl.[5] F16H 55/52; A63B 23/06
U.S. Cl. 474—11 18 Claims



1. A treadmill comprising in combination:

a. frame means for supporting an endless walking belt for movement;

b. a main drive motor;

c. variable speed transmission means for receiving drive input from said main drive motor and for delivering its drive output to move and adjust the speed of said walking belt;

d. said transmission means comprising variable pitch input pulley means for receiving shaft input from said main drive motor, variable pitch output pulley means for delivering shaft power to said walking belt, main drive belt means for transferring drive from said input pulley means to said output pulley means, and speed change means for varying the effective pitch of said input pulley means for altering the speed of said walking belt, said output pulley means including means affected by said main drive belt means to make a change in the effective diameter of said output pulley means;

e. programmed means in response to deenergization of said main drive motor to automatically energize said speed change means to change the effective diameter of said input pulley means to reset the transmission means to minimum walking belt speed; and

f. programmed speed reset means to continue rotation of said output pulley means to permit said output pulley means after said main drive motor is deenergized and while said speed change means is slowing down said walking belt to be adjusted properly by said main drive belt means while the effective diameter of said input pulley means is being changed.

4,944,714

METHOD AND APPARATUS FOR GUIDANCE AND ACTUATION OF FLAT BELT DRIVE UNDER EXTERNAL LOAD

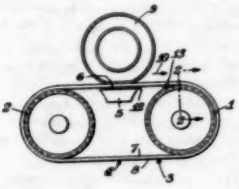
Karlheinz Storck, Muhltal, Fed. Rep. of Germany, assignor to Carl Schenck AG, Fed. Rep. of Germany

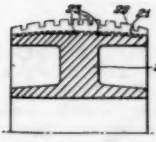
Filed Mar. 29, 1989, Ser. No. 329,943

Claims priority, application European Pat. Off., Apr. 22, 1988, 88106487.7

Int. Cl.[5] F16H *57/04*; F16N *15/00*

U.S. Cl. 474—91 **11 Claims**





1. A method for guiding and moving a flat belt having inner and outer surfaces and trained around a drive roller and an idler roller comprising the steps of applying a load to the outer load carrying surface of the flat belt, supporting the load from the inner surface of the flat belt, introducing a liquid flow onto the inner surface of the flat belt at the location where the load is applied to assist in supporting the load and to reduce friction, and draining liquid away from between the flat belt and drive and idler rollers in order to increase frictional engagement between the flat belt and the rollers.

4,944,715

CHAIN FOR V-PULLEY

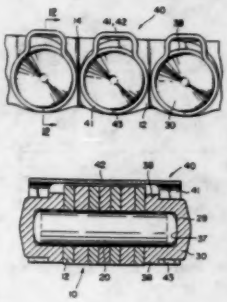
Seitaro Ueda, Kumagaya; Yukio Okubo, Fukaya; Shinichiro Izumi, Kumagaya, and Takeshi Hoshiro, Takarazuka, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo and Mitsuboshi Belting Ltd., Hyogo, both of, Japan

Filed Jun. 22, 1989, Ser. No. 370,000

Claims priority, application Japan, Jun. 27, 1988, 63-158254

Int. Cl.[5] F16G *1/22*

U.S. Cl. 474—245 **7 Claims**



1. A chain for a V-pulley having a plurality of link plates and a plurality of connecting pins connecting adjacent ones of said link plates in such a manner as to be bendable and used by being endlessly trained between a pair of V-pulleys, said chain comprising:

a plurality of blocks each provided on the outside of each of a plurality of outer link plates opposed to an inner wall of said V-pulley;

each of said blocks having a convey surface which is brought into contact with said inner wall of said V-pulley;

said convex surface being formed into the configuration of a cone or a truncated cone which has an apex angle substantially identical to that of said inner wall of said V-pulley and has an axis parallel to an axis of said connecting pin;

means for providing each of said blocks to be easily rotatable about the axis of said cone or said truncated cone.

4,944,716

WIRE NETTING BELT

Wilhelm Graff, Duren, Fed. Rep. of Germany, assignor to GKD Gebr. Kufferath GmbH & Co. KG, Duren, Fed. Rep. of Germany

Filed Aug. 4, 1989, Ser. No. 389,522

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828210

Int. Cl.[5] F16H *3/06*

U.S. Cl. 474—255 **17 Claims**

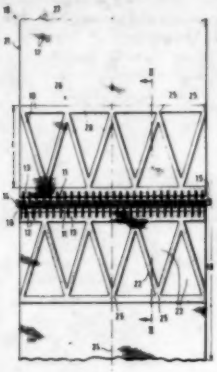
1. A wire netting belt comprising lengths of wire and meshes between adjacent lengths of wire having:

first and second belt ends, and end regions of the belt at said first and second ends respectively;

an elongate connecting element;

linking means at the belt ends, said linking means being engageable by the elongate connecting element to join the belt ends together, and

a reinforced portion of each said end region of the belt said reinforce dportions comprising a flexible solidified com-



position filled into the meshes of the belt regions over a limited length thereof.

4,944,717

RIBBED BELT FOR POWER TRANSMISSION

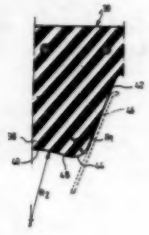
Pierre Georget, Chambray les Tours, France, assignor to Hutchinson, Paris, France

Filed Jun. 29, 1989, Ser. No. 373,140

Claims priority, application France, Jun. 30, 1988, 88 08807

Int. Cl.[5] F16G *5/06*

U.S. Cl. 474—238 **6 Claims**



1. A ribbed belt for transmitting power, the belt having an inner surface comprising circumferential ribs with truncated apexes each having a small base and cross-sections which are substantially trapeziumshaped, wherein the small base of each rib comprises a concave curved surface and joins the sides of the rib via convex curved surfaces.

4,944,718

ANGULAR VELOCITY MODULATING DEVICE

Toshiyuki Takahara, and Akira Takami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1989, Ser. No. 367,072

Claims priority, application Japan, Jun. 17, 1988, 63-80807[U]; Jun. 17, 1988, 63-80808[U]

Int. Cl.[5] F16H *55/17*

U.S. Cl. 475—16 **2 Claims**

1. An angular velocity modulating device which comprises:

first and second rotary shafts;

first and second bearing means;

primary angular velocity modulating means including

a first non-circular gear which is an internal gear rotatably supported, and

a second non-circular gear which is an external gear fixedly mounted on said first rotary shaft and engaged with said first non-circular gear,

with a primary angular velocity ratio for said first and second non-circular gears;

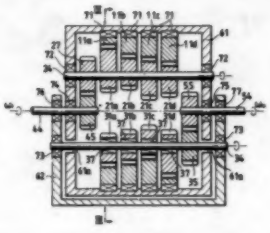
secondary angular velocity modulating means including said first non-circular gear, and

a third non-circular gear which is an external gear mounted on said second rotary shaft in such as manner as to be able to transmit power and engaged with said first non-circular gear,

with a secondary angular velocity ratio for said first and third non-circular gears;

a first frame supporting said first non-circular gear and said first rotary shaft through said first bearings; and

a second frame supporting said second rotary shaft through second bearings, said second frame being rotatably sup-



ported about the axis of rotation of said first non-circular gear, relative to said first frame, one of said first and second frames being stationary,

wherein said primary angular velocity ratio expressed by an exponential function $e^{K\theta}.F(0)$ where F(0) and K are the reference angular velocity ratio and the angular velocity modulating coefficient which are set to desired values in advance, and θ is the angular displacement of said first non-circular gear, and

said secondary angular velocity ratio expressed by an exponential function $e^{K(\theta+\alpha)}F(0)$ where F(0) is said reference angular velocity ratio, and α is the angle which is set to a desired value by adjusting the relative rotation of the said first and second frames, and

a condition is provided in which the ratio in angular velocity of said third rotary shaft to said second rotary shaft is given by an exponential function $e^{K\alpha}$, where K is said angular velocity modulating coefficient and α is said angle, which is the quotient of said secondary angular velocity ratio divided by said primary angular velocity ratio.

4,944,719

PLANETARY GEAR TYPE SPEED CHANGE DEVICE HAVING ONE-WAY CLUTCH OPERABLE IN TWO FUNCTIONS

Tokuyuki Takahashi, Aichi; Hiroshi Ito, and Seitoku Kubo, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 1, 1988, Ser. No. 226,470

Claims priority, application Japan, Aug. 5, 1987, 62-195471; Aug. 5, 1987, 62-195472

Int. Cl.[5] F16H *57/10*

U.S. Cl. 475—281 **5 Claims**

1. A planetary gear type speed change device comprising:

a housing;

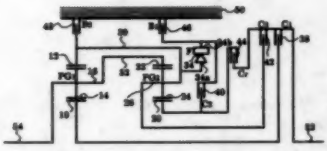
an input rotary member;

an output rotary member;

a first planetary gear mechanism having a first sun gear, a first ring gear, first planetary pinions and a first carrier;

a second planetary gear mechanism having a second sun gear, a second ring gear a second planetary pinions and a second carrier; and

interconnecting means including a plurality of clutches. at least one brake and at least one-way clutch and connecting said first and said second planetary gear mechanism between said input rotary member and said output rotary member so as to provide a plurality of forward speed stages according to selective engagement and disengagement of said clutches and said brake, wherein said one-way clutch has a first and second clutch member, said first clutch member engaging said second clutch member



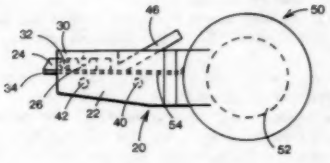
when said first clutch member attempts to rotate in a first rotational direction relative to said second clutch member and freewheeling in a second rotational direction opposite to said first rotational direction relative to said second clutch member, and while driving in a first forward speed stage said first clutch member is impelled in said first rotational direction with said second clutch member reacting in said second rotational direction and while driving in a second forward speed stage said second clutch member is impelled in said second rotational direction with said first clutch member reacting in said first rotational direction.

4,944,720

TAB FORMING DISPENSER WITH TAPE PASSING UNDER THE CUTTER

Robert N. Suhr, 431 Chowning Pl., NW., Marietta, Ga. 30064

Filed Jul. 31, 1989, Ser. No. 386,730
Int. Cl.[5] B26F *3/02*
U.S. Cl. 493—466 **8 Claims**



1. A method of forming a tab on the end of an adhesive tape on a tape dispenser, comprising the steps of:

(a) pulling a length of outstretched tape from a tape roll on the dispenser to a swingable cutter on the dispenser;

(b) passing the tape under the cutter, with the adhesive side of the tape facing down and away from said cutter; and

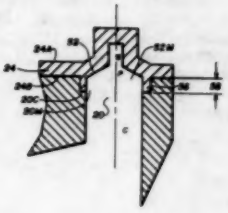
(c) swinging the cutter in an arc of approximately 180 degrees downwardly and onto the outstretched tape causing a leading portion of the tape to fold back on itself such that the adhesive side of a leading portion of the leading portion bonds to the adhesive side of the remaining portion of the outstretched tape to form a tab at the end of the outstretched tape.

4,944,721

CAVITY SEALING SYSTEM FOR A CENTRIFUGE ROTOR

David M. Carson, Newtown, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 9, 1988, Ser. No. 278,561
Int. Cl.[5] B04B *1/00, 7/02*
U.S. Cl. 494—16 **16 Claims**



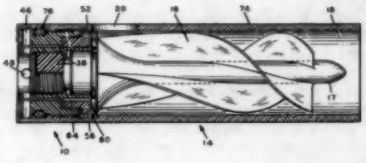
1. A cover for a centrifuge rotor having a body with plural cavities therein, the cover having an annular ring disposed thereon, an array of receptacles being formed in the annular ring, a plurality of flanges depending a predetermined distance from the cover, each flange being disposed in surrounding relationship with one of the receptacles, the receptacles being arranged so that when the cover is attached to the body each of the receptacles communicates with one of the cavities and each flange is receivable in one of the cavities.

4,944,722

PERCUTANEOUS AXIAL FLOW BLOOD PUMP

John W. Carriker, and Richard K. Wampler, both of Gold River, Calif., assignors to Nimbus Medical, Inc., Rancho Cordova, Calif.

Filed Feb. 23, 1989, Ser. No. 314,813
Int. Cl.[5] A61M *1/00*
U.S. Cl. 600—16 **6 Claims**



1. A cable-driven percutaneous insertable intravenous axial flow blood pump preloadable to provide a substantially constant purge pressure unaffected by manipulation of the pump drive cable or cable sheath, comprising:

(a) a static housing;

(b) a rotor disposed in said static housing;

(c) a drive cable for driving said rotor, said drive cable terminating in a cable fitting having a thrust bearing surface;

(d) rotor extension means for connecting said rotor to said drive cable through said static housing, said rotor extension means being resiliently extendable;

(e) movable bearing means disposed in said static housing, said rotor extension being journalled in said bearing means, and said bearing means having thrust bearing surface means for mating with said cable fitting thrust bearing surface to form a thrust bearing;

(f) shoulder means on said rotor extension means for engaging said movable bearing means when said extension is extended; and

(g) means for selectively fixedly interconnecting said mov-

able bearing means and said static housing to immobilize said movable bearing means within said static housing;

(h) whereby said thrust bearing can be preloaded to a predetermined load by pulling said cable fitting to extend said extension with a force greater than said predetermined load, relaxing said force to said predetermined load, and then immobilizing said bearing means.

4,944,723

UNIVERSAL DISPOSABLE SAFETY SYRINGE SYSTEM

Terry M. Haber, El Toro; Clark B. Foster, Laguna Niguel, and William H. Smedley, Lake Elsinore, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Feb. 2, 1989, Ser. No. 305,800

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **25 Claims**

1. A syringe comprising:

a cylinder having proximal and distal ends and receiving a supply of fluid at the interior thereof;

piston assembly means movable reciprocally through said cylinder;

a hypodermic needle cannula communicating with the fluid supply of said cylinder and projecting outwardly from the distal end of said cylinder for penetrating a targeted tissue area;

clamping means comprising at least one pair of normally open jaws between which said needle cannula is received, said jaws located within and closed by the distal end of said cylinder for releasably retaining said needle cannula at said distal end; and

means connected to and movable distally with said piston assembly means through said cylinder for sliding said jaws relative to the distal end of said cylinder and thereby causing said jaws to open and release said needle cannula from said distal end.

4,944,724

APPARATUS FOR LOCATING BODY CAVITIES HAVING SIGNALING INDICATOR

Edward M. Goldberg, Glencoe; Lev Melinyshyn, Mt. Prospect; Michael Jaron, Des Plaines, and Jeffrey M. Stupar, Chicago, all of Ill., assignors to Uresil Corporation, Skokie, Ill.

Continuation of Ser. No. 58,400, Jun. 5, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,366

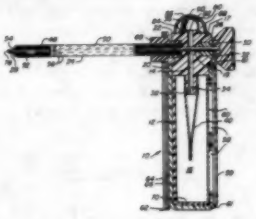
Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—118 **11 Claims**

1. An apparatus for locating a body cavity having a fluctuating fluid pressure and transporting fluid either into or out of the cavity, comprising:

a conduit for entering the cavity;

means, in communication with said conduit, for signaling the fluctuation of the fluid pressure in the cavity when said conduit enters the body cavity, said signalling means comprising a dome-shaped elastomeric element having a wall thickness gradually tapering from its base to its apex



which pulsates in response to the fluctuating fluid pressure in the body cavity; and

means, in communication with said conduit, for transporting fluid either into or out of the cavity.

4,944,725

SAFETY NEEDLE APPARATUS

Michael McDonald, 15847 Woodbine Circle, Mundelein, Ill. 60060

Continuation-in-part of Ser. No. 56,536, Jun. 1, 1987, Pat. No. 4,834,718. This application Apr. 11, 1989, Ser. No. 336,654

Int. Cl.[5] A61M *5/18*

U.S. Cl. 604—164 **11 Claims**

1. Clinical needle apparatus comprising:

a needle having a pointed forward end adapted to intentionally puncture the skin of a patient;

handle means secured to the needle rearwardly of the pointed end and adapted for manually pulling said needle rearwardly with a motion having only a rearward translational component in order to withdraw said needle from an intentional puncture site;

protective housing means having an interior needle-receiving passage therein and a guard means surrounding said passage;

said needle being received within said passage with said pointed end extending forwardly out of said passage, and being mounted therein in a manner to be moved rearwardly relative to said protective housing means;

said passage being long enough to permit said pointed end to be withdrawn rearwardly into said passage to prevent accidental punctures from occurring after said intentional puncture;

latch means on said handle means and said protective housing means interengaging upon rearward motion of said handle means and said needle relative to said protective housing means to prevent subsequent accidental forward motion of said handle means and said needle relative to said protective housing means;

said latch means being positioned so as to interengage only after said pointed end of said needle has entered said passage;

a catheter, one end of which is adapted to be inserted into a patient's blood vessel by means of said needle;

a catheter fitting comprising a generally tubular passage,

said catheter fitting being secured to an opposite end of the catheter;

said needle being slidably received within said catheter and said catheter fitting passage;

said protective housing means being positioned in relation to said catheter fitting so that rearward withdrawal of said needle from said catheter and from said catheter fitting passage by means of said handle means is automatically effective to withdraw said pointed end of said needle toward said protective housing passage, whereby said needle can be withdrawn from said catheter and into said protective housing passage with one continuous motion;

and locking means for locking said protective housing means to said catheter fitting when said pointed end of said needle extends inside said catheter fitting, and for unlocking said protective housing means from said catheter fitting as said pointed end is withdrawn from said catheter fitting, so that said protective housing means cannot be disconnected from said catheter fitting until said pointed end of said needle is withdrawn into said protective housing means, whereby said pointed end is continuously protected from exposure to accidental puncture from the time of withdrawal from said catheter;

said locking means comprising at least one resilient projection extending from said guard means, a boss on said resilient projection extending radially outwardly from said resilient projection, and a recess on said catheter fitting positioned to receive and engage said boss, thereby locking said housing to said catheter fitting;

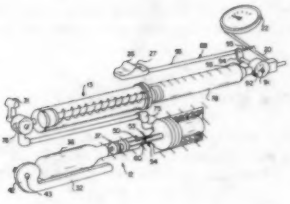
said resilient projection being adapted to flex radially inwardly in response to a rearward force applied to the handle means as said needle is pulled rearwardly into said catheter fitting beyond said boss, thereby unlocking said housing from said catheter fitting.

4,944,726

DEVICE FOR POWER INJECTION OF FLUIDS

Said S. Hilal, Laguna Niguel, and Robert P. Cooper, Yorba Linda, both of Calif., assignors to Applied Vascular Devices, Laguna Hills, Calif.

Filed Nov. 3, 1988, Ser. No. 266,200
Int. Cl.[5] A61M *5/145*
U.S. Cl. 604—143 **28 Claims**



1. A hand-held and operated pneumatically powered infusion/inflation device comprising in combination

(a) a housing adapted to be gripped and held by a human hand and containing

(b) a pressure vessel containing a gas under pressure

(c) valve means connected to the vessel for alternatively venting the gas and directing it to an infusion chamber

(d) an infusion chamber assembly comprising

(i) a power chamber having an inlet for receiving said gas and being connected in tandem to

(ii) an infusion chamber for holding an infusate having an outlet through which the infusate is ejected under the pressure exerted by said gas

(iii) a two-headed piston contained within and spanning the power and infusion chambers with one head positioned in the drive chamber and receiving pressure from the gas and the other head positioned in the infusion chamber and placing pressure on the infusate

(e) a second valve means connected to said outlet for controlling the pressurized flow of infusate from the infusion chamber; and

(f) a conduit connected to said valve means for carrying the infusate from the valve to an infusion/inflation site.

4,944,727

VARIABLE SHAPE GUIDE APPARATUS

William C. McCoy, Zionsville, Ind., assignor to Catheter Research, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 870,926, Jun. 5, 1986, Pat. No. 4,758,222, which is a continuation-in-part of Ser. No. 728,634, May 3, 1985, Pat. No. 4,601,705, which is a continuation-in-part of Ser. No. 547,402, Oct. 31, 1983, Pat. No. 4,543,090. This application Oct. 2, 1987, Ser. No. 103,926
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—95 **29 Claims**

1. A variable shape guide apparatus comprising

a temperature-activated memory element moving in a first direction to assume a predetermined shape when heated to a predetermined temperature,

spring means housing the memory element for yieldably urging the memory element in a second direction away from the first direction upon cooling of the memory element to a temperature less than the predetermined temperature so that the memory element is moved to assume a shape other than the predetermined shape, the spring means having an original shape alterable by movement of the memory element in its first direction toward its predetermined shape,

insulation means for preventing electrically conductive contact between the memory element and the spring means, and

control means for selectively heating the memory element so that the memory element is moved in the first direction against the urging of the spring means to permit an operator to alter the shape of the spring means automatically by heating the memory element, whereby the spring means is allowed to resume its original shape upon cooling of the memory element housed in the spring means, the spring means being an elongated coil spring formed to include a longitudinal cavity and the memory element being positioned in the longitudinal cavity.

4,944,728

INTRAVENOUS CATHETER PLACEMENT DEVICE

Michael W. Carrell, and Stephen H. Gericke, both of Oklahoma City, Okla., assignors to Safe Medical Devices, Inc., Moore, Okla.

Filed Oct. 17, 1988, Ser. No. 258,578
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—164 **16 Claims**

1. A safe intravenous catheter placement device comprising:

an elongated, tubular needle having a hollow interior and having a sharpened, pointed first end and a second end, said tubular needle having a plurality of radial blood flash ports extending radially through the wall of said needle at a location nearer to said second end of said needle than to said first end of said needle for discharging out through said radial flash ports, blood passing through said needle from a blood vessel;

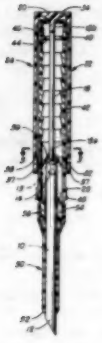
a tubular intravenous catheter end section positioned concentrically around a portion of said needle and including:

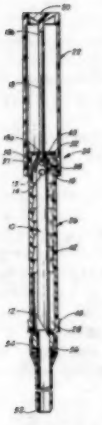
a first end adjacent the sharpened point at said first end of said needle and slidably encircling the outer periphery of the needle; and

an open, second end;

a protective sheath subassembly around a portion of said needle, which portion of said needle is located between the first end thereof and the second end thereof, and includes the second end thereof, said protective sheath subassembly comprising:

an elongated, tubular sheath which includes at the end thereof closest to the pointed first end of said needle, a transparent cylindrical end portion encircling the medial portion of said needle between the ends of said needle and





removably connected to the open second end of said catheter end section, said tubular sheath further including a blood-receiving flash chamber surrounding the portion of said needle having said radial blood flash ports therethrough, said flash chamber being located adjacent said transparent cylindrical end portion, said elongated tubular sheath surrounding a portion of said needle which is spaced therealong from said pointed first end of said needle; and

manual retracting means connected to said second end of said needle for retracting said needle through said catheter end section and said transparent cylindrical end portion, and into said tubular sheath so that said pointed first end of said needle is within said tubular sheath, said manual retracting means comprising:

an elongated tubular shaft having one of its ends connected to the second end of said tubular needle and defining a passageway communicating with the hollow interior of the needle; and

handle means connected to said elongated tubular shaft and including removable cap means selectively closing said tubular shaft at its end opposite its end connected to the second end of said needle; and

means for locking said needle in a retracted, protected position in which said pointed first end is within, and is protected by, said elongated tubular sheath.

4,944,729

FEMORAL ARTERIAL CANNULA

Gerald D. Buckberg; James V. Maloney, Jr., both of Los Angeles; Kenneth A. Jones, Lake Elsinore, and Weldon D. West, Mission Viejo, all of Calif., assignors to Shiley, Inc., Irvine, Calif.

Filed Aug. 29, 1988, Ser. No. 238,154
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—164 **12 Claims**

1. A cannula comprising:

an elongated tube having a flexible tip section adapted to be inserted into a wall of a vascular conduit and extend generally parallel to the axis of said conduit; and

a flexible intermediate section adjacent to said tip section having a diameter larger than that of the tip section whereby a shoulder is formed at the juncture of the two sections, said shoulder being sufficiently larger than the diameter of the conduit such that it engages the exterior of the conduit and limits the insertion of the tip section into the conduit, the surface of said shoulder for engaging the conduit substantially conforming to the exterior of the conduit consistent with the angle of insertion of the tip section into the conduit whereby a seal is formed by the shoulder with respect to the exterior of the conduit, said angle being an acute angle so as to facilitate the bending of the tube in insertion of said tip section into said conduit.

4,944,730

ORGANIZER AND DISPENSER FOR BLOOD SAMPLE NEEDLE HOLDERS

Andrzej J. Placinski, Norwood, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 23, 1988, Ser. No. 235,138
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—187 **7 Claims**

1. An assembly for organizing a plurality of blood sample needle holders in orderly fashion prior to use at a nursing tray or cart, characterized by

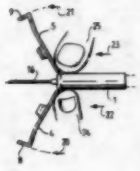
(a) an elongated substantially flat base;

(b) said elongated substantially flat base having a top surface and a bottom surface;

(c) an integral wall extending at right angles from each side edge of said flat base;

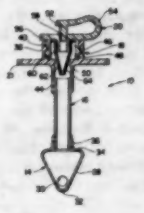
(d) each said integral wall extending in the same direction from said base to form a generally u-shaped structure;
(e) an integral flange extending at right angles from the edge of each of said walls opposite said base;
(f) each said flange extending toward each other to a point spaced from each other to define a holder receiving space; and
(g) each said flange being substantially parallel to said base to define a blood sample needle holder base receiving space;
(h) a plurality of blood sample needle holders;
(i) each said blood sample needle holder including
(1) a tubular body having a substantially closed one end and an open end;
(2) said substantially closed end having an opening positioned centrally thereof;
(3) said centrally positioned opening having screw threads therein for receiving a double-ended needle for taking a blood sample;
(4) an integral base flange extending outwardly from said open end;
(5) two diametrically opposed side edges on said base flange being straight;
(6) two diametrically opposed side edges on said base flange being curved; and
(7) the distance between said curved side edges being greater than the distance between said straight edges.

4,944,731
NEEDLE PROTECTION
John Cole, 33 Horsham Road, Pease Pottage, Near Crawley, Sussex, England RH11 9AW
Filed Mar. 14, 1989, Ser. No. 324,255
Claims priority, application United Kingdom, May 3, 1988, 8810366; May 25, 1988, 8812439; Jul. 14, 1988, 8816783
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—192 **2 Claims**



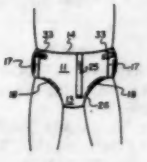
1. A needle protector for use with a hypodermic syringe which has a needle, a cylindrical body with a hub connecting the needle to the body and a plunger for movement within the body, the needle protector comprising a pair of arms mounted or mountable at or generally adjacent to the hub of the syringe and diametrically opposed, one to the other, on each side of the syringe, each arm being hinged or articulated so as to be capable of folding along the needle such as to shield and protect the tip thereof and being positively securable in that folded disposition, the arms additionally being pivotable away from the needle to lie alongside the body of the syringe, with the arms incorporating angled tabs or flaps constituting finger tabs for engagement by the first and second fingers respectively of a user on either side of the syringe for operation thereof by depression of the syringe plunger with the thumb of the user.

4,944,732
GASTROSTOMY FEEDING PORT
Ronald D. Russo, Barrington, R.I., assignor to Sandoz Nutrition Corporation, Minneapolis, Minn.
Filed Aug. 15, 1988, Ser. No. 232,597
Int. Cl.[5] A61M *39/02*
U.S. Cl. 604—247 **16 Claims**



1. A gastrostomy feeding port comprising a tip portion, a tube portion, a fitting portion and a valve portion, said tip portion being receivable through a preestablished stoma in the stomach of a patient and being operative for passing a fluid into said stomach, said tip portion including retaining means engageable with the inner wall of said stomach for preventing the inadvertent removal of said feeding port from said stoma, said tube portion communicating with said tip portion for passing said fluid thereto and extending rearwardly therefrom, said tube portion being dimensioned to extend outwardly through said stoma when said tip portion is in engagement with the inner wall of the stomach of said patient, said fitting portion being of a low-profile configuration and being attached to the rear end of said tube portion so that said fitting portion is disposed substantially on the exterior of said patient adjacent the skin surrounding said stoma when said tip portion is in engagement with said inner stomach wall, said valve portion being disposed substantially in said fitting portion and being accessible from the exterior of said patient, said valve portion comprising a valve element which is operative for permitting the flow of a feeding formula into said tube portion from said fitting portion and for preventing the reverse flow of said feeding formula and a closure element which is operative for removably sealing said fitting portion without interferring with said valve element.

4,944,733
DIAPER FOR USE IN TOILET TRAINING MALE CHILDREN OR FOR USE BY INCONTINENT MALE ADULTS
Larry Casale, 2092 Webster Dr., Park City, Utah 84060
Filed Jun. 12, 1989, Ser. No. 364,641
Int. Cl.[5] A61F *13/16*
U.S. Cl. 604—385.1 **6 Claims**



1. A diaper for attachment around the waist and legs of a user consisting of
a pad means having a front portion for placement over the groin area of a user, a back portion for placement about the buttocks of a user and a crotch portion for placement between the user's legs, said crotch portion connecting

said front and back portions, said front portion having a top edge and side edges, and said back portion having a top edge and side edges, said front portion side edges and said back portion side edges being interattachable about a user's legs, said front portion top edge and said back portion top edge forming a continuous edge about the user's waist when said front and back portion side edges are interattached about the user's legs, said front portion top edge having a central section located generally centrally between said front portion side edges,

attaching means for interattaching said front portion side edges with said back portion side edges,

first and second flap means extending from said central section of said front portion top edge into said crotch portion, said first and second flap means being movable from a first position forming an adjacent overlapping closure, to a second position forming a penile opening, and

a first adhesive fastening means for removably fastening said first flap to said second flap in said overlapping position.

4,944,734

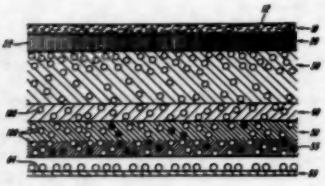
BIODEGRADABLE INCONTINENCE DEVICE WITH EMBEDDED GRANULES

Donald F. H. Wallach, Brookline, Mass., assignor to Micro Vesicular Systems, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 320,944, Mar. 9, 1989. This application Jun. 26, 1989, Ser. No. 371,210

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—358 **20 Claims**



1. An incontinence device having improved biodegradability comprising:

an inner layer which is substantially porous to allow the transfer of an aqueous solution into said device, said inner layer being made of a material which is substantially non-wettable;

one or more absorptive layers formed primarily of a cellulosic material, said cellulosic material having biodegradability enhancer granules embedded therein, said enhancer granules containing of a particulate material which degrades over time encapsulating a biodegradability enhancer agent selected from the group consisting of cellulase, hemicellulase or related cellulose degrading enzymes, and bacteria or spores which release cellulase, hemicellulase or related cellulose degrading enzymes; and

an outer layer which is substantially impermeable to water.

4,944,735

SHAPED NAPKIN WITH ELASTICIZED EDGES

Patti J. Mokry, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 581,945, Feb. 21, 1984, abandoned. This application Mar. 24, 1986, Ser. No. 843,332

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—385.2 **3 Claims**

1. A sanitary napkin comprising a cup-shaped napkin having arcuate inwardly extending edges that form the deepest portion of the cup corresponding generally to the perineal area in the area of narrowest width and wherein (a) the cupping is such that the angle formed by the outer profile of the edge of the napkin with the plane upon which the napkin rests is between 30° and 90°, (b) said cupping is achieved by elastic extending from 10 to 30 percent of the length of the side edges of said napkin, (c) said cupping is achieved by elastic located at or exterior of the area where a fluid impermeable baffle and a

fluid pervious cover are sealed together, (d) said napkin having a central portion which acts as a reservoir to provide additional time for fluid applied to said napkin to penetrate the cover, and (e) said napkin having an absorbent which has arcuate edges.

4,944,736

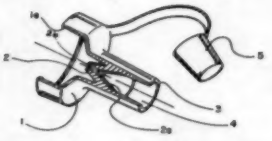
ADAPTOR CAP FOR CENTERING, SEALING, AND HOLDING A SYRINGE TO A BOTTLE

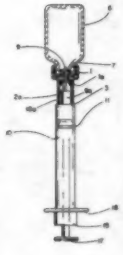
Leonard J. Holtz, 9474 Wayside Dr., Sunland, Calif. 91040

Filed Jul. 5, 1989, Ser. No. 375,504

Int. Cl.[5] A61B *19/00*; A61M *5/32*; B65B *7/28*

U.S. Cl. 604—403 **10 Claims**





1. For use with a liquid-containing bottle having a perforatable closure diaphragm, and a syringe: an adaptor cap having means to attach said cap to the bottle above the diaphragm, said cap having a body and a hollow portion extending outwardly from said body and terminating in a larger opening, a guide portion spaced from said larger opening and having converging surfaces terminating in a smaller hole inwardly in said hollow portion, said syringe having a barrel, a projection fittable into said larger opening extending from said barrel and carrying a hollow needle, whereby a user may insert said needle into the larger opening of said hollow portion, and then into said smaller hole and into and through said diaphragm, while the syringe projection enters said larger opening and is retained therein, thereby causing the needle to be axially aligned and penetrate the diaphragm immediately below said

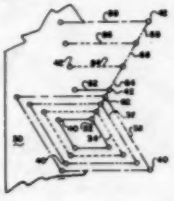
hole and causing said syringe and bottle to be frictionally held together.

4,944,737

SURGICAL STENCIL AND METHOD OF USING THE SAME

Robert F. Bloom, Lubbock, Tex., assignor to Kathryn Rowe Bloom, Lubbock, Tex.

Filed Dec. 14, 1988, Ser. No. 284,333
Int. Cl.[5] A61B *19/00*
U.S. Cl. 606—1 **4 Claims**



1. The method of performing flap surgery at a site on skin comprising:

a. selecting a shape of excision from a plurality of shapes of excision, then

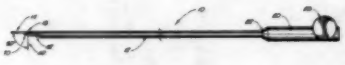
b. placing on the site a transparent stencil having lines and perforations depicting a plurality of sizes of the selected shape of excision and incision lines for flaps for each excision size.

4,944,738

SURGICAL LASER BACKSTOP INSTRUMENT

Michael A. Rodriguez, 929 Graham Dr., Suite B, Tomball, Tex. 77375

Continuation-in-part of Ser. No. 107,058, Oct. 13, 1987, Pat. No. 4,815,461. This application Mar. 22, 1989, Ser. No. 327,016
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—2 **18 Claims**



1. A surgical laser backstop instrument comprising:

a rod having a non-reflective surface;

a backstop pivotally connected to one end of said rod, said backstop comprised of a non-reflecting material; and

backstop adjustment means mounted to the other end of said rod, said backstop adjustment means for controlling the movement of said backstop.

4,944,739

BONE GRIPPING FIXATION CLAMP

Randall J. Torre, 842 S. Clover, San Jose, Calif. 95128

Filed Mar. 24, 1989, Ser. No. 328,494
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—53 **7 Claims**

1. A bone clamp for clamping bone segments together at an osteotomy site, comprising:

a pair of elongated members, each of said elongated members having a handle portion formed at an upper end thereof and a lower portion;

pivot means medially interconnecting said pair of elongated members;

a pair of bone-gripping means, each of said bone-gripping means rigidly attached to said lower portion of a respective one of said elongated members, each said bone-gripping means extending from its respective elongated member at a predetermined angle oriented to be substantially parallel to and adjacent the other one of said pair of bone-gripping means, each of said lower portions bent away from the other lower portion such that each one of said pair of bone-gripping means is disposed in a facing, opposed relationship having a horizontal and vertical offset therebetween; and

ratching means disposed between said elongated members disengagably coupling said handle portions together, said ratchet means having a plurality of discrete engagement points, each engagement point associated with a corresponding lateral separation between said pair of bone-gripping means, said ratohet means preventing said elongated members from rotating about said pivot means until said ratch means is disengaged.

4,944,740

OUTER EXCHANGE CATHETER SYSTEM

Maurice Buchbinder, and Ronald J. Solar, both of San Diego, Calif., assignors to Medtronic Versaflex, Inc., San Diego, Calif.

Continuation of Ser. No. 909,446, Sep. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 651,806, Sep. 18, 1984, abandoned. This application Aug. 18, 1988, Ser. No. 235,829
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—194 **4 Claims**

1. A method for dilating a stenosis in a passageway in a body, which comprises:

(a) introducing a guide catheter having proximal and distal ends and a single lumen into the body through an incision or opening;

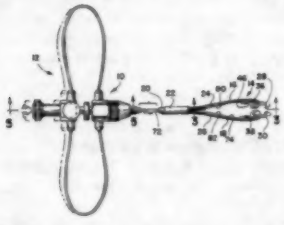
(b) advancing a catheter system comprising an outer sheath and a first steerable inner dilatation catheter having a control means, each of said outer sheath and said dilatation catheter having proximal and distal ends and said dilatation catheter having a dilatation balloon means adja-

cent the distal end thereof, into and through the guide catheter to cause said dilatation balloon means to be positioned across a stenosis in said passageway;
(c) inflating said first dilatation balloon means to cause the stenosis to dilate;
(d) deflating said dilatation balloon means;
(e) slidably advancing the outer sheath distally along said first dilatation catheter to position said outer sheath across the stenosis;
(f) withdrawing said first dilatation catheter in the proximal direction within said outer sheath to remove said first dilatation catheter from the body;
(g) advancing a second dilatation catheter having proximal and distal ends and larger dilatation balloon means distally within said outer sheath to cause the larger balloon dilatation means to be positioned across said stenosis;
(h) withdrawing said outer sheath in the proximal direction to the extent that the proximal end of the outer sheath is positioned near the proximal end of the second dilatation catheter;
(i) inflating said second balloon dilatation means; and
(j) repeating steps (d) to (i) until the stenosis is sufficiently dilated.

4,944,741
LAPROSCOPIC INSTRUMENT WITH PIVOTABLE SUPPORT ARM

Harrith M. Hasson, 2043 N. Sedgwick, Chicago, Ill. 60614

Filed Dec. 9, 1988, Ser. No. 281,626
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—206 **19 Claims**



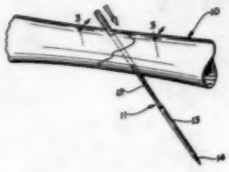
1. A surgical instrument for performing a laproscopic procedure, said instrument comprising:
an elongate stem having first and second jaws that are selectively movable towards and away from each other into closed and open positions respectively;
an arm having an elongate edge;
means for mounting the arm to one of said first and second jaws for movement between (a) a first position wherein the length of the edge is aligned lengthwise of said elongate stem and (b) a second position wherein the length of the edge is transverse to the position that said edge assumes, with the arm in its first position; and
means operable from a position remote from said arms for manually moving said arm selectively between said first and second positions.

4,944,742
BONE PIN

Alastair J. T. Clemow, Princeton; Scott H. Jaeger, Cherry Hill, both of N.J., and Allan Ritchie, Sway, England, assignors to Johnson & Johnson Orthopaedics, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 202,602, Jun. 6, 1988, Pat. No. 4,858,603. This application Jun. 5, 1989, Ser. No. 361,177
Int. Cl.[5] A61F *2/00*
U.S. Cl. 606—59 **7 Claims**

1. A bone pin comprising a tapered cylindrical portion made of polymeric material said pin having two ends, with one end tapered and a separate drill portion made of a metallic material affixed to said tapered end of the cylindrical polymeric portion, the cylindrical polymeric portion of the pin having a taper such that the diameter is reduced by from 0.005 to 0.05 millimeters per millimeter of length of the polymeric portion of the pin;

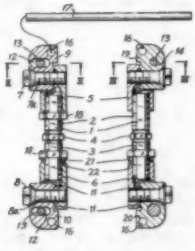


said polymeric portion and said drill portion being adapted for insertion into the bone as a unit, in one step, so as to maintain alignment of bone fragments during the one step insertion of said drill and said polymeric portion;
said drill portion being introduced on one side of the bone and drilled through and out of the other side of the bone so as to leave only the polymeric portion in the bone.

4,944,743
SPINAL FIXATION DEVICE

L. Gotzen, Marburg; Karl-Heinz Kunze, Kiel, both of Fed. Rep. of Germany, and Claudius Techow, Oxnard, Calif., assignors to Mecron Medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Sep. 12, 1988, Ser. No. 243,477
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733924
Int. Cl.[5] A61B *17/58*
U.S. Cl. 606—61 **9 Claims**



1. An implantable spinal column vertebral fixation for bridging at least one vertebral segment, comprising:
(a) a support bar having a longitudinal axis with a length corresponding to the vertebral segment which is to be bridged and having ends thereof threaded in opposite rotational directions;
(b) a pair of threaded jaw supports which are attachable to the two threaded support bar ends;
(c) a plurality of bone screws having heads extending radially from one end of the screw;
(d) a pair of bolt jaws rotatively attachable to the jaw supports and defining an axis of rotation between the jaws and the jaw support which is perpendicular to the support bar longitudinal axis, the bolt jaws each having a clamping screw oriented perpendicularly to the support bar longitudinal axis with the clamping screw selectively attachable

to the jaw supports for rigidly locking the jaw support to the bolt jaw, the clamping screw having a longitudinal axis;

(e) means for receiving the bone screws within the bolt jaw, which are oriented for captured passage of the bone screw therethrough in a direction generally perpendicular to each of the support bar and clamping screw longitudinal axes, so that the bone screws can be tightened with the heads substantially flush with the bolt jaw without cutting the bone screws; and

(f) the bolt jaws having recesses directly therein separate from the receiving means for engagement of lever-like positioning instruments, for alignment of vertebral segments attached to the fixation device.

4,944,744

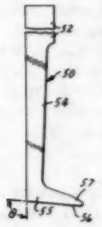
BONE IMPACTORS

Charles D. Ray, Wayzata, Minn., assignor to Surgical Dynamics, Inc., Alameda, Calif.

Continuation-in-part of Ser. No. 731,024, May 6, 1985, Pat. No. 4,657,002. This application Jul. 17, 1986, Ser. No. 887,607

Int. Cl.[5] A61B *17/16*

U.S. Cl. 606—79 **4 Claims**



1. A bone impactor which is useful for compressing a bone excrescence to relieve pressure on a nerve and comprises a handle and a shank which terminates in a foot that tapers to a thin toe, and a flat working surface beneath the foot that makes an angle of at least 95° with the longitudinal axis of the shank of the impactor, each edge of the working surface having a radius of at least 0.1 mm.

4,944,745

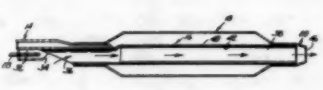
PERFUSION BALLOON CATHETER

David J. Sogard, Minneapolis, and Scott Savitt, Eden Prairie, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Feb. 29, 1988, Ser. No. 162,003

Int. Cl.[5] A61M *25/00*

U.S. Cl. 606—194 **44 Claims**



1. A perfusion balloon catheter for use in combination with a guide wire to dilate a stenosed coronary artery, the perfusion balloon catheter comprising:

an elongate shaft having an inflation lumen and a guide wire lumen integral therewith, with the guide wire lumen having a generally bevelled opening at its distal end;

a separate balloon head connected to a distal end of the shaft, the balloon head defining a relatively short blood flow channel, an open proximal end of the blood flow channel being defined by a generally bevelled opening which is opposite to, generally axially aligned with, and relatively closely longitudinally spaced from the bevelled opening at the distal end of the guide wire lumen, and the blood flow channel having a larger cross-section than the guide wire lumen;

a balloon mounted around the balloon head and defining a balloon interior which is in communication with a distal end of the inflation lumen; and

a distal tip connected to and extending distally from the balloon, the distal tip having a central passage aligned with the blood flow channel to permit blood flow from the artery into the bevelled opening of the blood flow channel, through the blood flow channel and through the central passage while the balloon is inflated, and also to permit the guide wire to move through the bevelled opening of the blood flow channel, through the channel and through the central passage.

4,944,746

METHOD OF AND APPARATUS FOR SEPARATING A BALLOON IN A BALLOON CATHETER

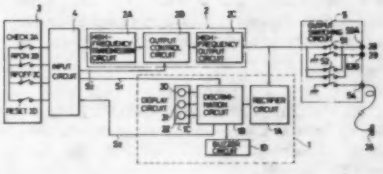
Hiroo Iwata, Suita; Sen Yamagata, Kyoto; Waro Taki, Osaka; Takehisa Matsuda, Minoo; Haruhiko Kikuchi, Suita; Yasuhiro Yonekawa, Kyoto, and Yasuhiro Goto, Aichi, all of Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Mar. 14, 1989, Ser. No. 322,923

Claims priority, application Japan, Mar. 18, 1988, 63-65084

Int. Cl.[5] A61M *29/02*

U.S. Cl. 606—195 **13 Claims**



1. In a balloon catheter having a catheter body and a balloon connected to said catheter body through a connecting member made of a heat-meltable material, said balloon being adapted to be charged with a settable liquid and then be separated from said catheter body as a result of melting of said connecting member by an electric current supplied between at least a pair of electrodes arranged on or in the vicinity of said connecting member,

a method of separating said balloon from said catheter body comprising:

measuring the impedance of an electrode circuit which includes said electrodes and lead lines connected to said electrodes;

comparing the measured value of said impedance with a predetermined reference range and judging that, when said measured value does not fall within said reference range, an abnormal condition exists in said electrodes; and

prohibiting the charging of said settable liquid into said balloon when existence of said abnormal condition is detected as a result of the judgment.

4,944,747

PAIN THERAPY TOOL AND METHOD

Gregory L. Newth, and Alice C. S. Newth, both of 59 East Taylor Hill Rd., Montague, Mass. 01351

Continuation of Ser. No. 105,313, Oct. 5, 1987, abandoned. This application Jan. 27, 1989, Ser. No. 303,992

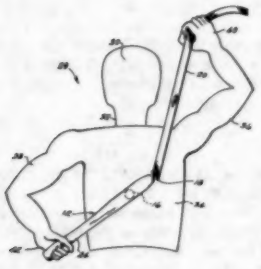
Int. Cl.[5] A61H *39/04*

U.S. Cl. 606—204 **12 Claims**

10. Trigger point pain therapy tool for the human body comprising:

elongated handle means having a pre-determined length and having a first end adapted for hand gripping and having an opposed second end, said first end of said handle means being free of any attachment to any other member;

only a single rigid protrusion extending laterally and outwardly from said handle means near said second end with said handle means being otherwise free of lateral protrusions, said rigid protrusion being adapted to apply pressure to the human body at a specified single area on the body, said single protrusion being substantially transverse to said length of said elongated handle means; and



flexible strap means having opposed first and second ends with said first end of said flexible strap means being pivotably connected to said second end of said handle means, and said second end of said strap means being free of any attachment to any other member.

4,944,748

MAGNETICALLY SUSPENDED AND ROTATED ROTOR

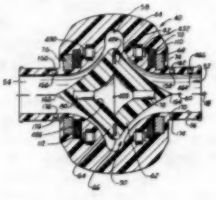
Gunter W. Bramm, Laisen Strasse 49, 8000 Munchen 2, Fed. Rep. of Germany, and Don B. Olsen, 8832 Blue Jay La., Salt Lake City, Utah 84121

Continuation of Ser. No. 914,486, Oct. 12, 1986, which is a continuation of Ser. No. 720,081, Apr. 4, 1985. This application May 9, 1988, Ser. No. 193,180

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[5] A61M *1/10*

U.S. Cl. 623—3 **10 Claims**



1. A pump implantable in the human body to provide a replacement for, or an assist to, the natural heart, comprising:

a housing constructed of or coated with a blood compatible material having an inlet passage and an outlet passage for connecting the pump into the circulatory system of the person into which the pump is implanted, the housing having an impellor chamber fluidly interposed between the inlet passage and the outlet passage;

an impellor constructed of or coated with a blood compatible material disposed in the housing impellor chamber and rotatable therein about an impellor rotation axis for drawing blood into the housing inlet passage and discharging blood from the housing outlet passage;

magnetic suspension means for magnetically suspending the rotor in said pump chamber out of contact with the walls of the impellor chamber, comprising:

permanent magnet impellor support means comprising an assembly of permanent magnets mounted on the impellor and on the housing for exerting forces on the impellor tending to align the rotation axis of the impellor with a selected support axis of the housing while tending to drive the impellor axially away from a selected null position on said support axis at such times that the impellor is axially displaced from the null position;

an electromagnet mounted on the housing and positioned thereon to exert a force directed along the support axis on portions of the permanent magnet impellor support means disposed on the impellor at such times that an electric current is passed through the electromagnet, the electromagnet thereby exerting an axial force on the rotor,

electromagnet control means mounted on the housing for detecting a displacement of the impellor from a control position of the impellor on the support axis and passing a current through the electromagnet to drive the impellor toward the control position; and

impellor drive means mounted on the housing for sensing a preselected physical quantity related to the flow of blood in said circulatory system and magnetically coupled to the impellor for rotating the impellor at a rate varying in accordance with a selected relationship to the value of said quantity.

4,944,749

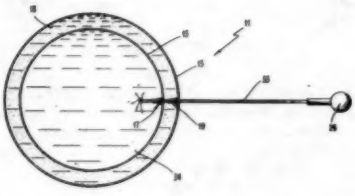
IMPLANT AND INFLATING CONSTRUCTION

Hilton Becker, 301 Dunbar Rd., Palm Beach, Fla. 33408

Continuation of Ser. No. 693,890, Jan. 23, 1985, abandoned. This application Jul. 27, 1988, Ser. No. 225,634

Int. Cl.[5] A61F *2/12, 2/02*

U.S. Cl. 623—8 **6 Claims**



1. An implant system comprising

inner and outer inflatable lumens each comprised of a respective membrane, said inner and outer lumens being unattached and freely movable relative to each other,

each of said membranes having a separate valve for inflating each lumen respectively,

a separate and removable filling tube adapted for penetrating each of said valves when they are in a predetermined position and aligned;

a volume of viscous gel between said inner and outer lumen for inflating the outer lumen,

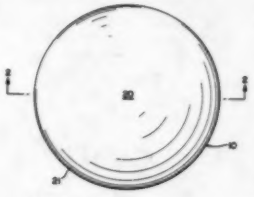
said valves having self sealing means whereby the filling fluid exerts a biasing force on the valve of the inner lumen which together with the viscous gel closes the valve of the inner lumen when the filling tube is removed and the viscous gel exerts a biasing force on the valve of the outer lumen which sealingly closes the valve of the outer lumen.

4,944,750

COMPOSITE SHELL MATERIAL FOR PROSTHESIS

James E. Cox, Jr., Oxnard, Calif., assignor to Cox-Uphoff International Reel, Carpinteria, Calif.

Filed Oct. 12, 1988, Ser. No. 256,659
Int. Cl.[5] A61F 2/12
U.S. Cl. 623—8 5 Claims



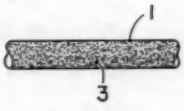
1. A composite material to form a flexible part of an implantable prosthesis intended to contain a fluid, said material comprising: an inner wall, an outer wall, and a foam layer between said walls in adherent surface-to-surface contact therewith, both of said walls being made of a flexible elastomeric material which is impermeable or has limited permeability, and said foam being resiliently deformable to resist sharp folding of the walls and resiliently to resist relative in-plane motion of the walls.

4,944,751

MATTED (DELUSTERED) ARTIFICIAL HAIR AND METHOD OF PREPARATION THEREOF

Shiro Yamada, No.2-7-1-606, Mita, Minato-ku, Tokyo, Japan

Division of Ser. No. 183,224, Apr. 19, 1988, Pat. No. 4,880,428.
This application Jan. 4, 1989, Ser. No. 301,861
Claims priority, application Japan, Dec. 25, 1986, 61-307867
Int. Cl.[5] A61F 2/10
U.S. Cl. 623—15 10 Claims



1. A method for the preparation of a matted artificial hair, comprising

applying an abrasive material to a bundle of monofilaments of a synthetic fiber having a substantially circular section,

scrubbing said monofilament bundle between two abrading plates each having a soft layer on a surface thereof by reciprocating the two abrading plates in the opposite directions at an angle of 45° to 90° with respect to the longitudinal direction of travel of the monofilament bundle while applying a slight pressure in the presence of said abrasive, and

controlling the rate of reciprocation of said plates relative to the rate of longitudinal travel of the monofilament bundle whereby a large number of scrubbed flaws are formed predominantly circumferentially with irregular size and shape on the surface of each monofilament of the bundle of monofilaments.

4,944,752

HAIR PROSTHESIS METHOD

Claudio Santi, Savona, Italy, assignor to SALC di Pellegrino & C.S.d.f., Savona, Italy

Continuation of Ser. No. 38,396, Apr. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 838,776, Feb. 12, 1986, abandoned. This application May 4, 1989, Ser. No. 351,325
Claims priority, application Italy, Feb. 14, 1985, 19513 A/85
Int. Cl.[5] A61F 2/10
U.S. Cl. 623—15 12 Claims

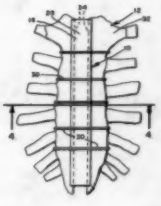
1. A method of permanently implanting human hair in human skin comprising the steps of forming one end portion of at least one human hair into a knotted elasto-rigid loop which is devoid of outwardly extending protrusions; attaching said loop to the tip of an implanting tool having a diameter less than that of said loop; introducing said tool and said loop into the subcutaneous region of a selected portion of the human skin at a selected entry point so that said tool provides a path for introduction of said loop into the skin and introduces said loop into the subcutaneous region of the skin; and extracting said tool by way of the selected entry point.

4,944,753

METHOD FOR PRODUCING RETRO-STERNAL SPACE

Frank M. Burgess, and Neal B. Burgess, both of 610 Amber Dr., Huntington Beach, Calif. 92648

Filed Sep. 26, 1988, Ser. No. 249,123
Int. Cl.[5] A61B 17/00
U.S. Cl. 623—16 15 Claims



1. A method for producing an artificial retro-sternal space during closure of a longitudinally severed sternum, comprising the steps of:

providing an implantable elongate member having a length approximately the length of the sternum,

disposing said member longitudinally along the severed sternum and opposing the posterior surface thereof, and

securing said disposed member to the sternum such that said member underlies the sternum when closed for assisting in guiding a sternum cutting device subsequently provided during a reserving of the sternum.

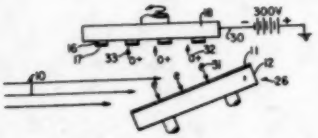
4,944,754
METHOD OF MANUFACTURING SYNTHETIC BONE COATED SURGICAL IMPLANTS

Leonard I. Linkow, New York, N.Y.; Anthony J. Armini, Bedford, Mass., and Anthony W. Rinaldi, Philadelphia, Pa., assignors to Vent-Plant Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 43,908, Apr. 29, 1987. This application Apr. 26, 1988, Ser. No. 193,505

Int. Cl.[5] C23C *14/46*

U.S. Cl. 623—16 **16 Claims**



1. A process for manufacturing a hydroxylapatite-coated implant suitable for implantation into an animal said implant having a fully crystalline hydroxylapatite coating comprising the steps of:

directing a high energy beam, operating at at least 10 kev energy, against a hydroxylpatite target positioned such that HA ions kicked off of the target strike the implant and apply an ion beam sputter coating of hydroxylapatite to said implant,

applying a negative potential to said implant material, ranging between about 300 volts and about 1000 volts, while the high energy beam is directed at the target,

heating said implant for between about 1 hour and about 24 hours at a temperature of between about 300° C. and about 900° C.,

conducting said process under a vacuum of less than or equal to 10^{-5} torr in the presence of a preselected amount of oxygen gas, and

recovering a fully crystalline hydroxylapatite-coated implant.

4,944,755
MOTORIZED JOINT

James R. Hennequin, Bedford, and Peter Flack, Cambridge, both of United Kingdom, assignors to Air Muscle Limited, Kepston Bedford, United Kingdom

PCT No. PCT/GB87/00743, § 371 Date Jun. 20, 1988, § 102(e) Date Jun. 20, 1988, PCT Pub. No. WO88/03008, PCT Pub. Date May 5, 1988

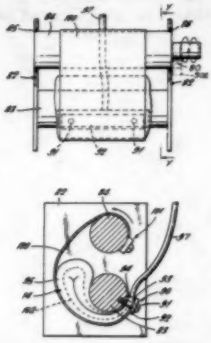
PCT Filed Oct. 21, 1987, Ser. No. 213,701

Claims priority, application United Kingdom, Oct. 21, 1986, 8625144

Int. Cl.[5] A61F *2/30*

U.S. Cl. 623—19 **10 Claims**

1. A motorized joint comprising a pair of relatively movable members; an elongate, inflatable element having an inextensible wall; means for holding apart opposing inner surfaces of the inflatable element such that a fluid passage exists within the inflatable element; actuating means having means for inflating the inflatable element causing it to increase in cross section; and means mounting the two ends of said inflatable element in a folded condition on one of the relatively movable members and acting on the other relatively movable member whereby



inflation of the inflatable element causes relative movement between the relatively movable members.

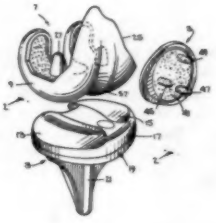
4,944,756
PROSTHETIC KNEE JOINT WITH IMPROVED PATELLAR COMPONENT TRACKING

Robert V. Kenna, Hobe Sound, Fla., assignor to Pfizer Hospital Products Group, New York, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,747

Int. Cl.[5] A61F *2/38*

U.S. Cl. 623—20 **7 Claims**



1. A knee joint prosthesis including a tibial component adapted to be secured to the proximal tibia and having a spaced pair of tibial condylar bearing portions; a patellar component adapted to be secured to the patella and having a patellar bearing surface; and a femoral component adapted to be secured to the distal femur and having an anterior plate portion adapted to contact said patellar bearing surface with the prosthetic knee joint at full extension, spaced femoral lateral and medial condylar bearing portions adapted for mutual articulation with said tibial condylar bearing portions, and a web portion joining said two femoral condylar bearing portions at their anterior ends and along at least a part of their respective lengths from said anterior ends, said femoral condylar bearing portions having generally convex bearing surfaces and said web portion having a concave bearing surface, said anterior plate portion, femoral condylar bearing surfaces and web portion bearing surface defining together a continuous track to cooperate with said patellar bearing surface and guide the patellar component during flexion of the prosthetic knee joint from a fully extended state to a fully flexed state, and with the bearing surface of said lateral femoral condylar bearing portion, as viewed in transverse cross sections through said femoral bearing portion along said track, being steeply sloped towards said web portion over at least the innermost one-third

of the width of the bearing portion so as to substantially deepen the lateral wall of said track guiding the patellar component and thereby reduce the tension on the quadriceps mechanism at high degrees of flexion and substantially increase the maximum level of flexion achievable with the prosthetic knee joint,

the generally convex bearing surface of said lateral femoral condylar bearing portion exhibiting, as viewed in transverse cross sections through said bearing portion along said track, a smooth continuous line consisting essentially of, from outside to inside, a first arcuate outer segment having a radius of curvature R_1, which runs into a second segment, which runs in turn into a third arcuate inner segment having a radius of curvature R_2, said second segment being relatively flat, R_2 being at least about 2.5 times R_1, and the arc length of the third segment being at least about as long as the length of said second segment.

4,944,757

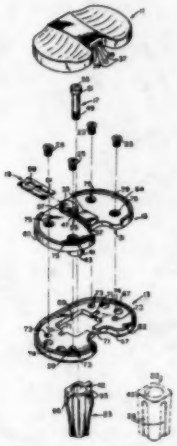
MODULATOR KNEE PROSTHESIS SYSTEM

David M. Martinez, 5486 Quail Ridge, Camarilo, Calif. 93010; Roger G. Carignan, 2570 Calle Abedul, Thousand Oaks, Calif. 91360, and S. David Stulberg, 5739 S. Blackstone Ave., Chicago, Ill. 60607

Filed Nov. 7, 1988, Ser. No. 268,056

Int. Cl.[5] A61F 2/38

U.S. Cl. 623—20 **20 Claims**



1. A modular knee joint prosthesis variably using selected prosthetic components to join a variably resected tibia bone to a femur bone comprising:

a tibial platform defining a tibia implantable stem on a bottom surface and an upraised boss on a top surface which is adapted to engage a surface operatively associated with the femur, said platform having engaging and peripheral edges on a bottom surface of said platform to engage components to vary the orientation of said platform between and relative to said femur and tibia bones.

4,944,758

ARTIFICIAL FINGER JOINT

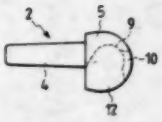
Katsutoshi Bekki, and Shigeo Niwa, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Sep. 16, 1988, Ser. No. 245,255

Claims priority, application Japan, Sep. 18, 1987, 62-141586[U]

Int. Cl.[5] A61F 2/42, 2/32

U.S. Cl. 623—21 **10 Claims**



1. An artificial finger joint comprising:

a first member adapted for fixation to a first bone including a butt portion shaped generally as a single ball located at one end of said first member and having a socket type structure with an internal opening and a long guide groove extending to said internal opening;

a second member adapted for fixation to a second bone in contact with the butt portion of said first member and including an expanded portion at one end of said second member and a generally cylindrical portion, adjacent the expanded portion along the member, said expanded portion formed as an integral part of said second member and fitted in said internal opening of said first member;

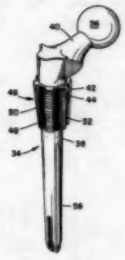
a thin projection along both sides of said long guide groove preventing said expanded portion from separating from said internal opening except at prescribed positions of said first and second members, said long guide groove being adapted for guiding the movement of said second member as it bends relative to said first member in a prescribed direction and said cylindrical portion being adapted for sliding on the projection along the long guide groove; and

an insertion opening in said butt portion for receiving said expanded portion and leading to said internal opening of said butt portion, said insertion opening being located below an upper side of said butt portion.

4,944,759
POROUS-COATED ARTIFICIAL JOINTS

Thomas H. Mallory, Columbus; Timothy McTighe, Chagrin Falls, both of Ohio, and Douglas G. Noiles, New Canaan, Conn., assignors to Joint Medical Products Corporation, Stamford, Conn.

Continuation of Ser. No. 256,126, Oct. 6, 1988, Pat. No. 4,883,491, which is a continuation of Ser. No. 820,772, Jan. 21, 1986, abandoned. This application Sep. 5, 1989, Ser. No. 402,803
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] A61F 2/28, 2/30, 2/34
U.S. Cl. 623—22 11 Claims



1. A prosthesis comprising a body having an outside surface upon which is formed a screw thread for engagement with bone, the screw thread being interrupted by porous-coated columns so as to produce an alternating pattern of threaded columns adjacent to porous-coated columns, the threaded columns being free of porous coating and providing initial mechanical fixation of the prosthesis to the bone and the porous-coated columns allowing long-term fixation through bone ingrowth and remodeling.

4,944,760
METHOD AND INSTRUMENTATION FOR THE REPLACEMENT OF A KNEE PROSTHESIS

Robert V. Kenna, Saddle River, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,714
Int. Cl.[5] A61F 2/38
U.S. Cl. 623—20 7 Claims

1. A method for surgically replacing in a patient a previously implanted knee joint prosthesis comprising a first femoral component and a first tibial component with a revision knee joint prosthesis comprising a second femoral component and a second tibial component while retaining the lateral and medial collateral ligaments intact and functional, with each of said first and second femoral components and first and second tibial components comprising a spaced pair of bearing members adapted to fit when implanted against the surgically prepared distal femur and proximal tibia, respectively, said first femoral component bearing members being adapted for mutual articulation with said first tibial component bearing members and said second femoral component bearing members being adapted for mutual non-linked articulation with said second tibial component bearing members, and the bearing members of said first and second femoral components including a distal portion adapted to contact the associated tibial component bearing member when the prosthetic knee joint is in extension and a posterior portion adapted to contact the associated tibial component bearing member when the prosthetic knee joint is in flexion, comprising the steps of

(a) selecting a second tibial component;

(b) selecting a second femoral component having bearing members with thicker distal and posterior portions than the bearing members of said first femoral component;

(c) removing said first femoral component and said first tibial component from the body of the patient;

(d) cutting the distal end of the patient's femur and the proximal end of the patient's tibia to prepare said femur and tibia to fit closely with said second femoral component and said second tibial component upon the implantation thereof; and

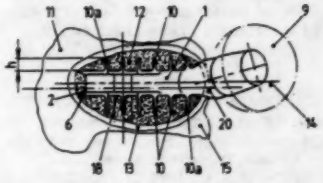
(e) implanting said second femoral component and said second tibial component at the distal end of the patient's femur and the proximal end of the patient's tibia, respectively,

with the dimensions of the bearing members of said second femoral component and said second tibial component being selected so that the natural anatomic transverse joint plane and collateral ligamentous balance are restored in extension and flexion of the prosthetic knee joint.

4,944,761
BLADE-LIKE STEM FOR A FEMORAL HEAD PROSTHESIS

Karl-Gerhart Stuhmer, Ravensburg, Fed. Rep. of Germany, and Rudolf Koch, Berglingen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 8, 1989, Ser. No. 447,687
Claims priority, application Switzerland, Jan. 10, 1989, 70/89
Int. Cl.[5] A61F 2/36
U.S. Cl. 623—23 12 Claims



5. A stem for a femoral head prosthesis having

a distal zone;

a proximal zone of rectangular cross-section extending from said distal zone along a longitudinal axis, said proximal zone widening in a medial direction and a lateral direction longitudinally thereof and having a plane posterior side and a plane anterior side; and

a plurality of sharp-edged ribs extending from each said side in parallel to said axis for implanting in spongy tissue of a femur, said ribs on said anterior side being of less height than said ribs on said posterior side, the outermost ribs on each said side being sized to bear on a hard cortical shell of the femur bone to define a resilient four point bearing on the cortical shell with the innermost ribs disposed within the spongy tissue and spaced from the cortical shell.

4,944,762
JOINT ENDOPROSTHESIS

Helmut D. Link, Hamburg, and Arnold Keller, Kayhude, both of Fed. Rep. of Germany, assignors to interplanta Arzt-und Krankenhausbedarf GmbH, Hamburg, Fed. Rep. of Germany

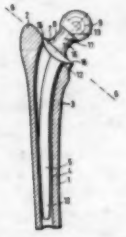
Filed Sep. 11, 1986, Ser. No. 907,122
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125657; May 3, 1982, 3216533
Int. Cl.[5] A61F 2/32
U.S. Cl. 623—23 3 Claims

1. A joint endoprosthesis for use with an elongate bone having a bone axis, a hollow interior and a joint end, the joint end modified to expose the hollow interior and create a cylindrical prepared joint surface, the joint surface surrounding one end of the hollow interior and having a resection line at an

angle to the elongate bone axis, the joint endoprosthesis comprising:

an elongate shaft defined by a longitudinal axis and having first and second ends, said first end configured to be inserted into the hollow interior of said bone and said second end to be adjacent to the prepared joint surface;

said second end having attached thereto a support plate



having an upper surface and a lower surface, said lower surface defining a cylindrical convex surface corresponding to a concave shape of the prepared joint surface;

a combination neck and joint head extending from said upper surface of the support plate wherein said combination neck and joint head defines a central axis; and

said cylindrical surface having an axis of rotation which is spaced eccentrically from said central axis.

4,944,763

FIXING STEM FOR A PROSTHESIS

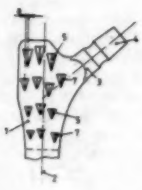
Hans-Georg Willert, Gottingen, Fed. Rep. of Germany, and Rudolf Koch, Berlingen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 11, 1989, Ser. No. 393,525

Claims priority, application Switzerland, Aug. 24, 1988, 3144/88

Int. Cl.[5] A61F 2/36, 2/30

U.S. Cl. 623—23 **11 Claims**



1. A fixing stem for a prosthesis having a plurality of discrete projections in a proximal zone, each said projection being of pyramidal prism shape having an apex directed in a distal direction and an axis directed in parallel to a longitudinal axis of the stem and inclined at an acute angle to said longitudinal axis, said projections having a constant ratio of base height to length along said longitudinal axis with said projections at a proximal end of said zone having a greater base height than projections at a distal end of said zone.

4,944,764

HIP PROSTHESIS

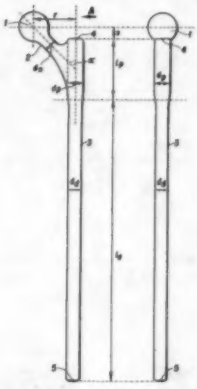
Clifford A. Stossel, Kent, England, assignor to Headcorn Instrumentation Ltd., Kent, England

Filed Jun. 13, 1988, Ser. No. 205,835

Int. Cl.[5] A61F 2/32, 1/04

U.S. Cl. 623—23 **1 Claim**

1. A hip prosthesis consisting essentially of a generally spherical head, a generally cylindrical neck and a generally cylindrical elongate straight shaft; said shaft being about 18 cm to about 40 cm long, said shaft having a proximal end and a distal end for insertion into the femur of a subject in need of the prosthesis, wherein a distal portion of said shaft has an outer diameter of about 1.3 cm to about 1.5 cm and a proximal portion of said shaft, less than 9.5 cm long and shorter than said distal portion, has an outer diameter of about 1.4 cm to about 1.6 cm and which is greater than said distal portion; wherein



said neck is integrally mounted on said proximal portion of said shaft, the angle between the respective longitudinal axes of said neck and said shaft being about 45°; wherein said head, integrally mounted on said neck, has a diameter of about 2.25 cm to about 5.5 cm; wherein said proximal end of said shaft is spaced by between about 0.5 cm and about 1.5 cm from the plane defined by the center of said head and normal to the longitudinal axis of said shaft; and wherein said center of said head is offset by between about 3.5 cm and about 4.25 cm from said longitudinal axis of said shaft.

4,944,765

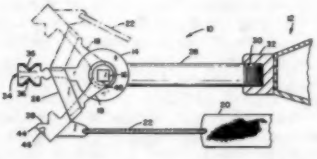
PROSTHETIC DRIVE DEVICE FOR ROTATABLE TOOL

Danny M. Keith, General Delivery, Broadford, Va. 24316

Filed Mar. 20, 1989, Ser. No. 325,999

Int. Cl.[5] A61F 2/54

U.S. Cl. 623—65 **14 Claims**

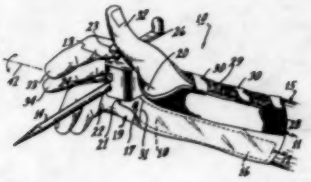


1. A tool drive device adapted for attachment to and use with an artificial arm prosthetic member adapted to be affixed to an arm segment for movement therewith, said tool drive comprising tool body means, tool holder means rotatably mounted on said tool body means, lever means engaging said holder means and adapted to be attached to one end of body strap means the other end of which is operator body mounted, whereby relative motion between said operator body and said arm segment will tension said strap means and cause said lever means to rotate said tool holder means relative to said tool body means.

4,944,766
GRIPPING DEVICE

Brian R. Williams, 32802 Valle Rd. #32, San Juan Capistrano, Calif. 92675

Continuation of Ser. No. 167,338, Mar. 14, 1988, abandoned. This application Jul. 20, 1989, Ser. No. 383,281
Int. Cl.[5] A61F 2/68
U.S. Cl. 623—65 22 Claims



1. A prosthetic device, comprising:

an elongated support member having first and second end portions and an intermediate portion extending between the first and second end portions; and

gripping means attached to the second end portion of the elongated support member for holding first and second implements so that a user can support a selected one of the first and second implements in a hand of the user without having to grip the selected one;

the first end portion being dimensioned and arranged to be held on the arm of the user with the first end portion in a position adjacent the inner wrist such that the support member extends toward the hand;

the intermediate portion being dimensioned and arranged to curve slightly over the heel of the hand;

the second end portion being dimensioned and arranged to extend toward the palm of the hand with the gripping means supported generally at the palm of the hand; and

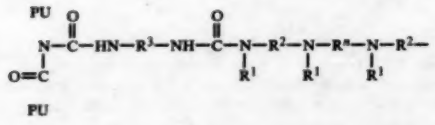
the gripping means being configured so that the first implement is held in a position approximating a conventional writing position and so that the second implement is held in a position such that the second implement extends along a line that lies in a plane generally perpendicular to the axis of the arm, which line is inclined to the plane of the palm toward the thumb.

4,944,767
SYNTHETIC MATERIAL APT TO STABLY ADSORB HIGH QUANTITIES OF HEPARIN, AND PROCESS FOR THE PRODUCTION THEREOF

Rolando Barbucci, Siena; Paolo Ferruti, Milan; Adalberto Grossi, Siena, all of Italy, and Wilfried G. Lemm, Berlin, Fed. Rep. of Germany, assignors to G. Creamascoli S.p.A., Milan, Italy

Filed Jan. 15, 1987, Ser. No. 3,537
Claims priority, application Italy, Jan. 16, 1986, 19094 A/86
Int. Cl.[5] A61F 2/54
U.S. Cl. 623—66 22 Claims

1. Synthetic material apt to stably adsorb high quantities of heparin, characterized in that said synthetic material consists of a polyurethane resin, cross-linked with copolymeric chains in correspondence of at least part of the urethane groups



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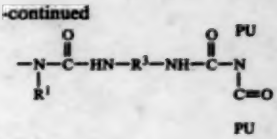
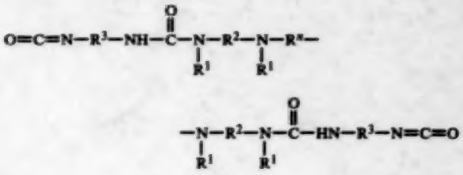


of said resin, as per the following general formula:



wherein,

PU—is a polyurethanic polymeric chain;

R^1 is an alkyl or aralkyl, containing functional groups inert to isocyanates;

R^2 is an alkylene;

R^3 is an alkylene, arylene or other bivalent organic residue of a diisocyanate; and

R^n is a polyamidoaminic radical.

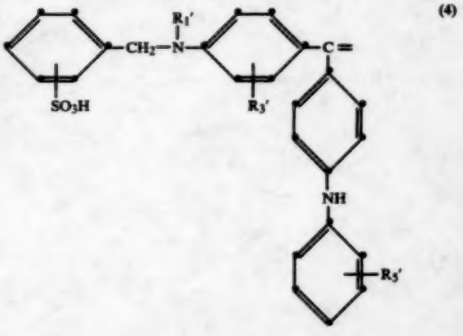
4,944,768
SOLID FORMULATION OF ANIONIC WOOL DYES WITH ANIONIC DISPERSANT AND AMPHOTERIC SURFACTANT: GLYCINE OR BETAINE

Paolo Ballielo, Rheinfelden, Fed. Rep. of Germany; Otto Schilling, Basel, and Beat Bruttel, Böckten , both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 92,800, Sep. 3, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 309,921
Claims priority, application Switzerland, Sep. 10, 1986, 3638/86
Int. Cl.[5] C09B 67/24; C11D 1/88; D06P 3/14
U.S. Cl. 8—524 12 Claims

1. A solid formulation comprising 20 to 80% by weight of at least two anionic wool dyes, 1 to 20% by weight of an anionic dispersant and 1 to 20% by weight of at least one amphoteric surfactant, the anionic wool dyes being selected from the group consisting of

(a) triphenylmethane dyes having at least two sulfonic acid groups of the formula



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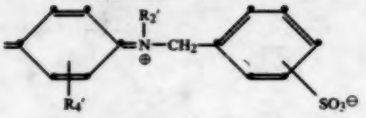
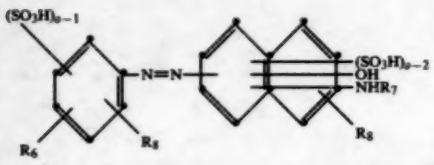


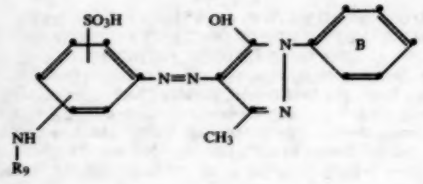
in which R_1', R_2', R_3' and R_4' independently of each other are C_{1-4}-alkyl and R_5' is C_{1-4}-alkyl, C_{1-4}-alkoxy or hydrogen,

(b) monoazo and disazo dyes of the formula



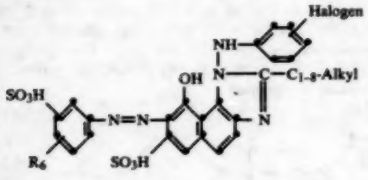
(5)

in which R_6 is a fibre-reactive group bonded via a —NH— group, benzoylamino, phenoxy, chlorophenoxy, dichlorophenoxy or methylphenoxy, R_7 is hydrogen, benzoyl, phenyl, C_{1-4}-alkyl, phenylsulfonyl, methylphenylsulfonyl or a fibre-reactive group which is or is not bonded via aminobenzoyl, and the substituents R_8 are independently of each other hydrogen or a phenylaminosulfonyl or N-phenyl-N-methylaminosulfonyl radical,



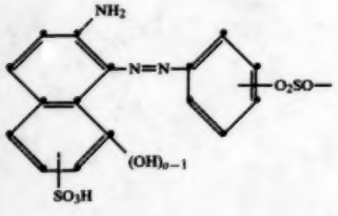
(6)

in which R_9 is a fibre-reactive group and the phenyl ring B can be substituted by halogen, C_{1-4}-alkyl and sulfo,



(7)

in which R_6 is as defined under formula (5), and



(8)

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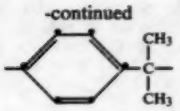
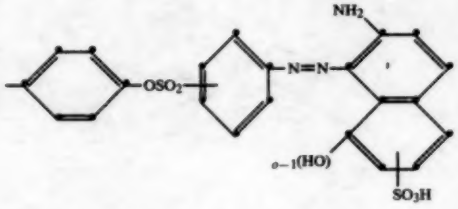
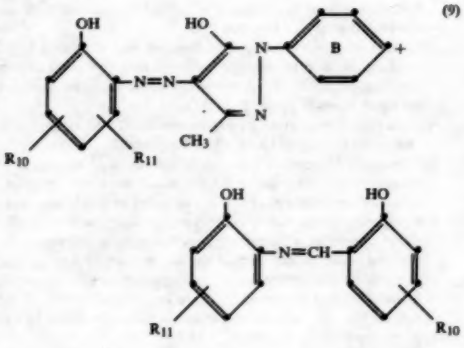




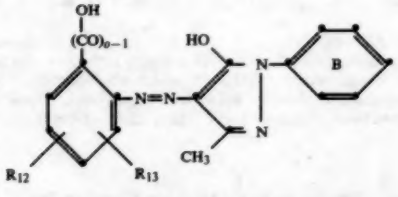
(c) the 1:2 chromium complex dyes of the azo and azomethine dyes of the formula (9)



(9)

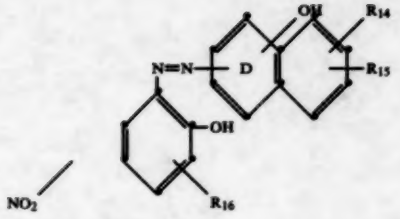
in which R_{10} is hydrogen, sulfo or phenylazo, R_{11} is hydrogen or nitro, and the phenyl ring B can contain the substituents specified under formula (6):

(d) the symmetrical 1:2 chromium complex dyes of azo dyes of the formulae (10) and (11)



(10)

in which the phenyl ring B can contain the substituents specified under formula (6) and R_{12} and R_{13} independently of each other are hydrogen, nitro, sulfo, halogen, C_{1-4}-alkylsulfonyl, C_{1-4}-alkylaminosulfonyl or $—SO_2NH_2$;

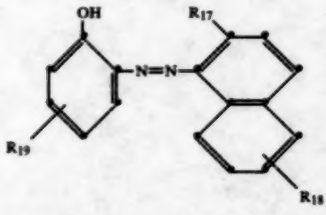


(11)

in which R_{14} is hydrogen, C_{1-4}-alkoxycarbonylamino, benzoylamino, C_{1-4}-alkylsulfonylamino, phenylsulfonylamino, methylphenylsulfonylamino or halogen, R_{15} is hydrogen or halogen, and R_{16} is C_{1-4}-alkylsulfonyl,

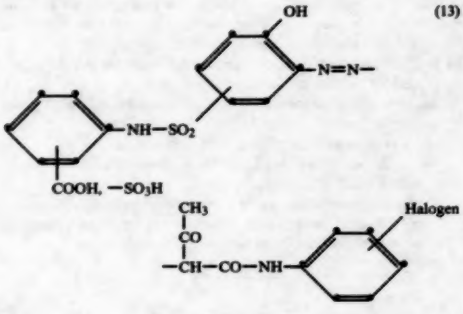
C_{1-4}-alkylaminosulfonyl, phenylazo, sulfo or $-SO_2NH_2$, and where the hydroxyl group in the benzo ring D is bonded in o-position relative to the azo bridge to the benzo ring D;

the symmetrical 1:2 cobalt complexes of azo dyes of the formulae



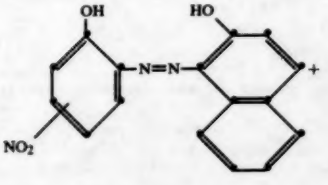
(12)

in which R_{17} is the —OH or NH_2 group, R_{18} is hydrogen or C_{1-4}-alkylaminosulfonyl, and R_{19} is nitro or C_{1-4}-alkoxy-C_{1-4}-alkyleneaminosulfonyl; or



(13)

the 1:2 chromium complex dyes of azo dyes of the formulae



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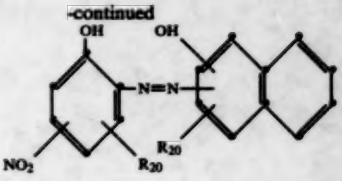
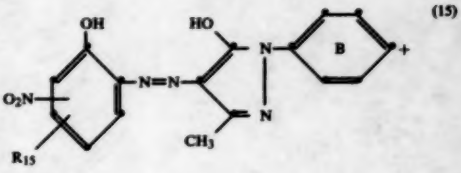


in which one of the substituents R_{20} is hydrogen and the other is sulfo;



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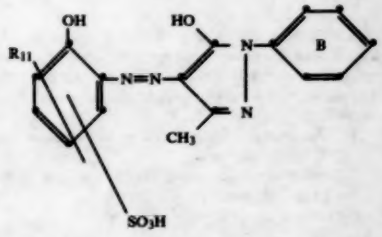
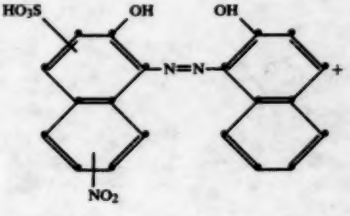
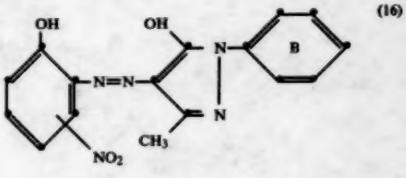


in which R_{11} is as defined under formula (9) and R_{15} is as defined under formula (11), and the phenyl rings B independently of each other can contain the substituents specified under formula (6); or of the formulae





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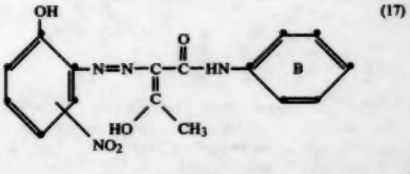

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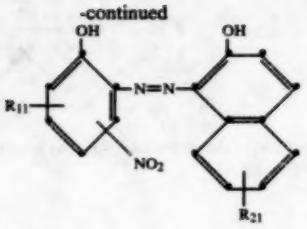
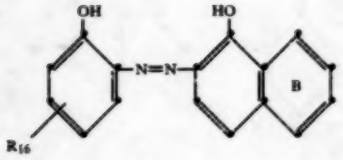


(18)



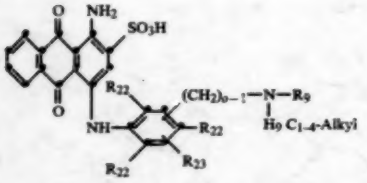
(19)

in which the phenyl ring B in the formulae (16), (17) and (19) can contain the substituents specified under formula (6), R_{11} is as defined under formula (9), R_{21} is hydrogen, methoxycarbonylamino or acetylamino, and R_{16} is as defined under formula (11);

1:2 chromium complex dyes of azo dyes of the formulae (10)+(11); and

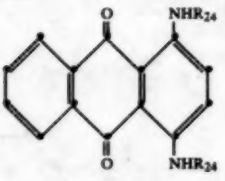
1:2 chromium mixed complexes of azo dyes of the formulae (10) and (11); and

(e) anthraquinone dyes of the formulae



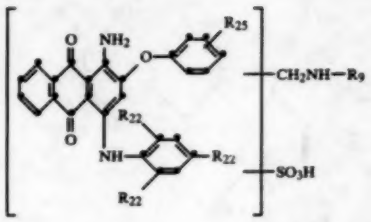
(20)

in which R_9 is as defined under formula (6), the R_{22}s independently of each other are hydrogen or C_{1-4}-alkyl, and R_{23} is hydrogen or sulfo;



(21)

in which the substituents R_{24} independently of each other are cyclohexyl or the diphenyl ether radical which can be substituted by sulfo or the radical —CH_2NH—R_9 in which R_9 is as defined under formula (6); and



(22)

in which R_9 is as defined under formula (6), R_{22} is as defined under formula (20), and R_{25} is C_{4-8}-alkyl.

4,944,769

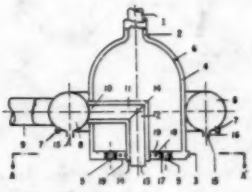
PROCESS FOR THE GRANULATING OF SULPHUR

Roberto Garcia, and Jose H. da Silva, both of Belo Horizonte, Brazil, assignors to Petroleo Brasileiro S.A. - PETROBRAS, Rio de Janeiro, Brazil

Filed Sep. 16, 1987, Ser. No. 97,031

Int. Cl.[5] B01J *2/00*; B29B *9/00*

U.S. Cl. 23—293 S **6 Claims**



1. A process for granulating sulfur in which a hollow cylindrical jet of melted sulfur strikes a disk resting on a shaft and able to turn freely upon being struck in any way, between the middle of an the outer edge of such disc wherein

a jet of water is provided inside the cylinder produced by said jet of melted sulfur;

another jet of water is provided surrounding said jet of sulfur;

the jets of water and sulfur strike such disk;

the sulfur solidifies into granules as result of the two jets of water striking it; and

said granules and the water are spun out beyond the surface of the disk, said water having been so spun out being substantially free from any solidified sulfur.

4,944,770

MOTOR FUEL ADDITIVE AND ORI-INHIBITED MOTOR FUEL COMPOSITION

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco, Inc., White Plains, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,865

Int. Cl.[5] C10L *1/18, 1/22*

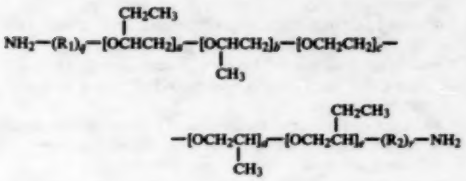
U.S. Cl. 44—073 **9 Claims**

1. A composition obtained by reacting, at a temperature of 30° C.–200° C.:

(a) 0.5–2.5 moles of an alkyl-substituted phenol;

(b)0.5–2.5 moles of an aldehyde; and

(c) 0.5–1.5 moles of a polyoxyalkylene diamine of the formula



where R_1 and R_2 are C_1–C_{12} alkylene groups, q and r are integers having a value of 0 or 1, c has a value from 2–150, b+d has a value from 2–150, and a+e has a value from 2–12.

4,944,771

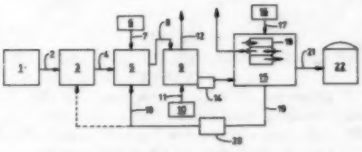
METHOD FOR METHANE PRODUCTION

Richard T. Schneider, 17 Alachua Highlands, Alachua, Fla. 32615, and Frederick A. Hauck, 2 Grandin Terr., Cincinnati, Ohio 45208

Division of Ser. No. 54,529, May 27, 1987, Pat. No. 4,869,729. This application Jul. 19, 1989, Ser. No. 382,545

Int. Cl.[5] C07C 9/04

U.S. Cl. 48—197 R **8 Claims**



1. A process of producing methane which comprises:

forming aluminum carbide by reducing aluminum hydroxide with excess carbon derived from coal at a temperature of at least 1250° C., including the steps of admixing powdered coal and aluminum hydroxide, preheating the mixture in a fluidized bed in a reducing atmosphere, passing the preheated mixture from said fluidized bed downwardly through a flame wherein said mixture is heated to a maximum temperature sufficient to cause melting of aluminum hydroxide with solution of at least part of said coal therein while still in a reducing atmosphere, and collecting the melt in a pool wherein reaction to form aluminum carbide is substantially completed;

quenching the aluminum carbide together with impurities admixed therein;

hydrolyzing said aluminum carbide in the presence of an acid catalyst to form aluminum hydroxide and a hydrocarbon gas consisting essentially of methane; and

returning aluminum hydroxide and admixed impurities formed in the hydrolyzing step to the aluminum carbide forming step for forming additional aluminum carbide.

4,944,772

FABRICATION OF SUPPORTED POLYCRYSTALLINE ABRASIVE COMPACTS

Hyun S. Cho, Sandy, Utah, assignor to General Electric Company

Filed Nov. 30, 1988, Ser. No. 277,874

Int. Cl.[5] B24D 3/00

U.S. Cl. 51—293 **12 Claims**

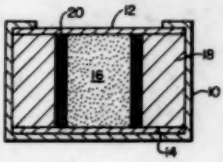
1. A process for fabricating a supported polycrystalline diamond or CBN bi-layer compact which comprises:

(a) forming a sintered polycrystalline diamond or CBN compact having a surface;

(b) separately forming a cemented carbide support having a support surface;

(c) mating said compact and said support at their respective surfaces with a layer of diamond or CBN crystals having a largest dimension of between about 30 and 500 micrometers interposed between said surfaces;

(d) providing a source of catalyst/sintering aid material in association with said layer of crystals;



(e) subjecting said mated compact and support to HP/HT conditions and for a time adequate for converting said diamond or CBN crystals into a polycrystalline diamond or CBN layer and for providing a support polycrystalline bi-layer compact comprising at least two polycrystalline layers.

4,944,773

BONDED ABRASIVE TOOLS WITH COMBINATION OF FINELY MICROCRYSTALLINE ALUMINOUS ABRASIVE AND A SUPERABRASIVE

Charles V. Rue, Petersham; Leonard G. Pukalte, West Boylston, and Krishnamoorthy Subramanian, Groton, all of Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 95,781, Sep. 14, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 243,284

Int. Cl.[5] B24D 3/04

U.S. Cl. 51—307 **19 Claims**

1. A bonded abrasive tool comprising generally discrete, size graded abrasive grits held in a matrix of a bond material chemically distinct from said abrasive grits, wherein said grits are a mixture of superabrasive grits and aluminous grits, said aluminous grits consisting predominantly of approximately equiaxed alpha alumina or alumina spinel microcrystallites having a maximum dimension of no more than about one micron that have been nickel coated before being bonded into the tool.

4,944,774

HARD FACING FOR MILLED TOOTH ROCK BITS

Madapusi K. Keshavan, Fullerton, Calif.; Lance D. Underwood, Spring, Tex.; Naresh J. Kar, Westminster, Calif.; Thomas W. Oldham, Mission Viejo, Calif.; Cary A. Roth, Moreno Valley, Calif., and Brian J. Armstrong, Seal Beach, Calif., assignors to Smith International, Inc., Houston, Tex.

Division of Ser. No. 139,602, Dec. 29, 1987. This application Mar. 27, 1989, Ser. No. 329,251

Int. Cl.[5] B24D 3/02

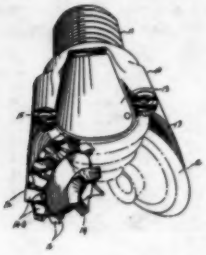
U.S. Cl. 51—309 **23 Claims**

1. A rock bit hard facing comprising:

steel in the range of from 18% to 32% by weight; and

filler in the range of from 68% to 82% by weight, the filler comprising:

from 20% to 65% by weight single crystal monotungsten carbide particles;



from 35% to 80% by weight cemented tungsten carbide particles; and

a balance of steel deoxidizer.

4,944,775

PREPARATION OF POLY(PHENYLENE OXIDE) ASYMMETRIC GAS SEPARATION MEMBRANES

Richard A. Hayes, Parkersburg, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 11, 1989, Ser. No. 378,097

Int. Cl.[5] B01D *53/22, 69/04, 71/38*

U.S. Cl. 55—16 **27 Claims**

1. A process for preparing an integrally-skinned asymmetric poly(phenylene oxide) gas separation membrane comprising,

forming a solution of from 5 to 50 weight percent of film forming molecular weight poly(2,6-dimethylphenylene-1,4-oxide) in a solvent mixture comprising a main constituent of an aprotic solvent at from 50° C. to 200° C.,

forming said solution into a nascent membrane,

partially drying said nascent membrane for 0.005 to 10 minutes at 20° C. to 200° C., and

precipitating said nascent membrane in a coagulation bath at 0° C. to 80° C., said coagulation bath being a non-solvent for the poly(phenylene oxide) while being miscible with the main constituent of the solvent mixture.

26. A gas separation membrane prepared by the process of claim 1.

4,944,776

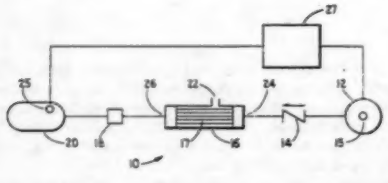
DEHUMIDIFIER FOR WAVEGUIDE SYSTEM

Lloyd A. Keyser, Dallas; Donald A. Nelson, Allen, and David C. Thornton, Grapevine, all of Tex., assignors to Andrew Corporation, Orland Park, Ill.

Filed Oct. 5, 1989, Ser. No. 417,595

Int. Cl.[5] B01D *53/22*

U.S. Cl. 55—16 **42 Claims**



1. A method of dehumidifying gas comprising the steps of

routing gas through a membrane cartridge for a first time period, said membrane cartridge having membranes which filter water vapor contained in said gas through said membranes, said membrane cartridge having a first outlet for ejecting dehumidified gas from said cartridge and a second outlet for ejecting water vapor from said cartridge;

directing said dehumidified gas from said first outlet of said membrane cartridge into a dry gas system; and

passing gas back into said membrane cartridge through said first outlet for a second time period after said first time period.

25. A gas supply system for furnishing pressurized and dehumidified gas to a selected space, said system comprising

a primary gas source for supplying pressurized gas,

a membrane cartridge having an inlet for receiving said pressurized gas from said primary gas source and an outlet for supplying dehumidified, pressurized gas to said selected space, said cartridge having membranes which filter water vapor contained in said gas through said membranes, and a second outlet for ejecting water vapor from said cartridge,

control means for repetitively energizing and de-energizing said primary gas source so that said pressurized gas is supplied intermittently to said selected space, and

a secondary gas source for supplying gas to said membrane cartridge when said primary gas source is de-energized so as to maintain the effectiveness of said membranes during the periods of de-energization of said primary gas source.

4,944,777

SEPARATING HYDROGEN FROM A MIXTURE OF SUBSTANCES

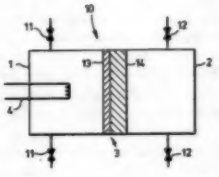
Walter T. Shmayda, 240 Melrose Avenue, King City, Ontario, Canada; Francois Waelbroeck, Mannheimer Str. 4, D-5170 Juelich, Fed. Rep. of Germany; Peter Wienhold, Rurallee 7, D-5172 Linnich, Fed. Rep. of Germany, and Joerg Winter, Auestrasse 36, D-5162 Niederzier, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,623

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434150

Int. Cl.[5] B01D *53/22, 71/02*

U.S. Cl. 55—16 **9 Claims**



1. A method of separating hydrogen from a gas mixture by diffusion, which method comprises:

providing a diffusion cell including first and second chambers separated by a non-porous membrane which is selectively permeable to hydrogen, the membrane comprising at least two layers consisting respectively of a first material on one side of the membrane adjacent to the first chamber and a second material on the other side of the membrane adjacent to the second chamber, the first material being less dissolving to hydrogen and having a lower release rate constant at the operating temperature than the second material,

admitting the gas mixture to the first chamber,

at least partially dissociating the hydrogen of the mixture in said first chamber,

contacting the mixture with said one side of the membrane whereby hydrogen diffuses through the membrane, and

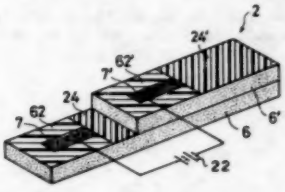
collecting the diffused hydrogen in said second chamber.

4,944,778

ELECTROSTATIC DUST COLLECTOR

Motoo Yanagawa, Tokyo, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Continuation of Ser. No. 754,314, Jul. 12, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 389,414
Claims priority, application Japan, May 30, 1985, 60-115342; May 30, 1985, 60-115343
Int. Cl.[5] B0BC 3/00
U.S. Cl. 55—131 5 Claims



1. An electrostatic dust collector comprising a filter element formed of narrow elongated strips of pliable, porous dielectric filter material having a gas barrier film on at least one surface thereof of each strip, said narrow strips and electrodes therebetween being superimposed in face to face contact, and at least on one gas barrier film and electrode therebetween and on each strip, so that said pliable, porous dielectric filter material fills the space between the gas barrier film and electrodes with no air gap exists between said face to face strips, means for applying an electrical voltage to said electrodes for forming an electrical field therebetween in the pores of said porous dielectric filter material and means for passing gas containing particles through said strips in a stream parallel to said contacting faces and said gas barrier film therebetween and through said pores of said porous material to electrically charge said particles and to attract said charged particles to a wall of said pores charged by said electrical field to remove said charged particles from said gas passing therethrough.

4,944,779

VAPOR RECOVERY SYSTEM

Emil Szlaga; Robert S. Harris, and Robert H. Thompson, all of Connersville, Ind., assignors to Stant Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 236,798, Aug. 26, 1988, Pat. No. 4,836,835, which is a continuation-in-part of Ser. No. 106,632, Oct. 8, 1987, Pat. No. 4,816,045, which is a continuation-in-part of Ser. No. 846,081, Mar. 31, 1986, Pat. No. 4,770,677. This application Apr. 7, 1989, Ser. No. 334,724
The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.
Int. Cl.[5] B01D 53/00
U.S. Cl. 55—168 23 Claims

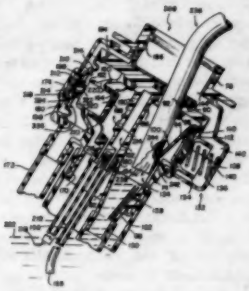
1. An apparatus for recovering fuel vapors discharged from a vehicle fuel system during refueling, the vehicle fuel system including a fuel tank having a filler neck and canister means for processing fuel vapor, the apparatus comprising

means for conducting fuel vapor between the fuel tank and the canister means,

first valve means for selectively blocking flow of fuel vapor through the conducting means, the first valve means being movable in the conducting means between a flow-blocking position and flow-delivery positions, the first valve means dividing the conducting means upon movement of the first valve means to its flow-blocking position into an inner region communicating with the fuel tank and an outer region communicating with the canister means,

first passageway means for communicating a closing pressure from the fuel tank to the first valve means to move the first valve means to its flow-blocking position,

means for selectively venting the first passageway means to the atmosphere to dissipate any closing pressure therein to permit pressure generated by fuel vapor in the fuel tank having a magnitude in excess of a predetermined threshold level and communicated to the first valve means via the inner region of the conducting means to apply a load to the first valve means sufficient to move the first valve means from its flow-blocking position to a flow-delivery position, thereby permitting pressurized fuel vapor to



flow from the fuel tank to the canister means through the conducting means, and

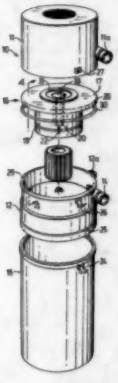
second passageway means for communicating fuel vapor from the first passageway means to the inner region of the conducting means while the first valve means is in its flow-blocking position, the second passageway means being situated outside of the fuel tank filler neck.

4,944,780

CENTRAL VACUUM CLEANER WITH DETACHABLE FILTER ASSEMBLY

Kal Usmani, 11 Morningdew Dr., Brantford, Ontario, Canada N3R 3P1

Filed Feb. 17, 1989, Ser. No. 311,807
Claims priority, application Canada, Jan. 12, 1989, 588134
Int. Cl.[5] B01D 50/00
U.S. Cl. 55—337 3 Claims



1. A cyclonic-separator type central vacuum cleaner comprising releasably secured sub-assemblies including:

a motor/exhaust housing sub-assembly having an exhaust outlet, and housing a fan motor and a vacuum inducing fan operably connected in driven relation therewith, said housing having a substantially open bottom;

a substantially open topped and open bottomed vacuum inlet sub-assembly, adapted to be secured to a vacuum cleaner-supporting horizontal surface, and releasably secured in axial register with said substantially open bottom of said motor/exhaust housing sub-assembly, said vacuum inlet sub-assembly comprising a cylindrical body having a tangential air inlet arranged adjacent the substantially open top thereof;

a substantially open topped dust collecting sub-assembly releasably secured in axial register with the open bottom of said vacuum inlet sub-assembly;

an in-line-filter-supporting vortex finder comprising a plate releasably secured in removable clamped relation intermediate between said motor/exhaust housing and vacuum inlet sub-assemblies, said plate defining a septum between the open base and the open top of the respective ones of the motor/exhaust housing and vacuum inlet sub-assemblies and having a generally centrally located aperture communicating between opposed sides of said plate and opening on one side thereof into a cylindrical vortex finder that is secured at a first end thereof to said one side of said plate, and extends downwardly from said one side into the interior of said vacuum inlet sub-assembly to terminate below said tangential air inlet at a second open end, in inlet airflow deflecting relation;

wherein filter mounting means is fixed to said vortex finder with a demountable filter secured thereto in vortex finder supported relation, said filter being shielded by said cylindrical vortex finder and arranged therein in operative inline filtering relation of an airflow passing from within said cylindrical vortex finder and through said aperture, that is induced between said inlet and said exhaust outlet by the operation of said vacuum inducing fan.

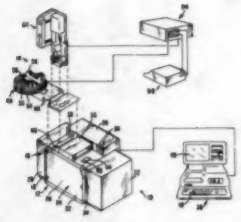
whereby, with the motor/exhaust housing sub-assembly removed from said vacuum cleaner and the plate thereby released from said secured clamped relation, said vortex finder is upwardly removable from said vacuum inlet sub-assembly with said filter transported therein in shielded relation, to permit said vortex finder to be inverted and the filter demounted from said filter mounting means without undue release of dust into a surrounding living space.

4,944,781

GAS CHROMATOGRAPH/AUTOSAMPLER COUPLING ASSEMBLY

Donald A. Ruggirello, Sunrise, and Christopher R. Banfield, Plantation, both of Fla., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jul. 12, 1989, Ser. No. 378,745
Int. Cl.[5] B01D *53/02*; G01N *30/88*
U.S. Cl. 55—386 **25 Claims**



1. An assembly for coupling an autosampler mounted on a mounting plate, to a gas chromatograph having an injection site, said assembly comprising:

bracket means for mounting said mounting plate to said gas chromatograph, said bracket means being secured to said gas chromatograph adjacent injection site so as to permit access to said injection site by said autosampler; and

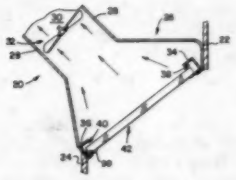
securement means for securing said mounting plate on said bracket means.

4,944,782

BAFFLE TYPE HOOD AND DUCT FILTERS FOR COMMERICAL USE

Narayanan Rajendran, Melrose Park, and Karl G. Otzen, Barrington, both of Ill., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 360,367, Mar. 22, 1982, abandoned.
This application Feb. 6, 1989, Ser. No. 308,957
Int. Cl.[5] B01D *45/00*
U.S. Cl. 55—444 **22 Claims**



1. A combination range hood filter and flame arrester unit adapted for removable reception in an associated range hood, said unit including a body having upstream and downstream face elements, with said upstream face element being subdivided into generally planar, upper, lower and side surfaces combining to define the outer front face margins of said body, and a plurality of contoured front panels joined at their ends to at least two of said front face margin surfaces, said contoured front panels being also spaced apart from each other to define therebetween plural air inlet areas, with each contoured panel including an outer marginal surface, tapered offsetting surfaces, and a flat central impactor panel offset toward the interior of the said body from the plane of the surrounding marginal panel surfaces, with said downstream face element also including upper, lower and side surfaces defining the outer rear face margins of said body, and a plurality of contoured panels joined at their respective ends to at least two said rear face margin surfaces, said contoured rear panel also having outer, generally planar margins, inner offset surfaces lying inwardly of said body, and offsetting surfaces extending between said panel margins and said inner offset surfaces, with said rear panels being likewise spaced apart from each other so as to define therebetween plural air outlet areas, with said individual front and rear panels being arranged in staggered, partially overlapping relation to one another to provide a labyrinthine flow path for grease-laden exhaust air, and with each panel further including means defining a path for accumulated grease and the like to drain from the surfaces of said panels past at least said bottom face margin of said body to a collection area.

4,944,783

METHOD FOR PRODUCING GLASS PREFORM FOR SINGLE MODE OPTICAL FIBER

Hiroyasu Hongo, and Yuji Takahashi, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 8, 1988, Ser. No. 281,067
Claims priority, application Japan, Dec. 11, 1987, 62-312104
Int. Cl.[5] C03B *19/06*, *37/07*
U.S. Cl. 65—3.11 **3 Claims**

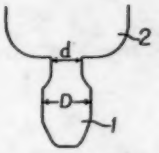
1. A method for producing a glass preform for use in the fabrication of a single mode optical fiber, which comprises steps of:

forming a porous core body and a porous cladding body simultaneously while heating a part of the porous core

body to partially shrink the core body so that a ratio of a diameter of the shrunk part of the core body to that of the unshrunk part of the core body is adjusted in the range between 0.65 and 0.9 by

measuring the diameters of the shrunk part and the unshrunk part of the core body,

calculating a ratio of the diameter of the shrunk part of the



core body to that of the unshrunk part of the core body and

adjusting a heating degree of the part of the core body to be shrunk so that said ratio of the diameters is in said range through adjustment of temperature at the part of the core body, and

then heating the porous glass preform to consolidate it to obtain a transparent glass preform.

4,944,784

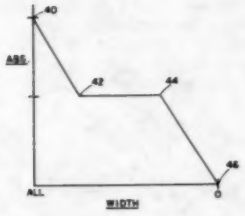
PROCESS FOR PREPARING A BOROSILICATE GLASS

Jeffrey T. Kohli, Alfred, and James E. Shelby, Alfred Station, both of N.Y., assignors to Alfred University, Alfred, N.Y.

Filed Nov. 3, 1989, Ser. No. 431,633

Int. Cl.[5] C03C *3/091, 23/00*; C03B *32/00*

U.S. Cl. 65—32.3 **20 Claims**



1. A process for preparing a surface-darkened glass, comprising the steps of sequentially:

(a) providing an alkali alumino-borosilicate silicate glass comprised of from about 50 to about 85 weight percent of silica, from about 4 to about 26 weight percent of boron, from about 1 to about 26 weight percent of alumina, from about 0 to about 20 parts per million of silver ion, from about 0 to about 20 parts per million of halide ion, from about 0.2 to about 10.0 weight percent of antimony ion, and alkali, wherein said alkali is selected from the group consisting of from about 2 to about 8 weight percent of lithium oxide, from about 4 to about 15 percent of sodium oxide, from about 6 to about 20 weight percent of potassium oxide, from about 8 to about 25 weight percent of rubidium oxide, from about 10 to about 30 weight percent of cesium oxide, and mixtures thereof; and

(b) subjecting said glass to a temperature of from about 350 to about 1,000 degrees Celsius for from at least about 30 minutes while contacting said glass with hydrogen-containing gas.

4,944,785

PROCESS USING MELT ACCELERATOR FOR THE CONVERSION OF SOLID WASTE SUBSTANCES INTO GLASS

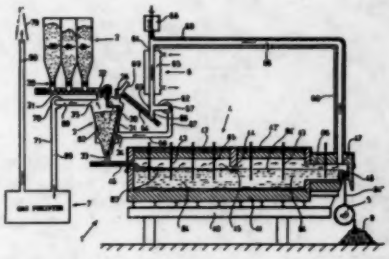
Helmut Sorg, Glattbach; Helmut Pieper; Hartmut Zachocher, both of Lohr/Main, and Heinz Meriet, Kelkheim, all of Fed. Rep. of Germany, assignors to SORG Gmbh & Co. KG, Lohr-/Main and Metallgesellschaft AG, Frankfurt, both of, Fed. Rep. of Germany

Filed Jun. 23, 1989, Ser. No. 370,593

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1988, 3841889; Feb. 2, 1989, 3904613

Int. Cl.[5] C03B *5/04*

U.S. Cl. 65—136 **12 Claims**



1. Process for converting solid, dehydrated waste substance into glass, comprising

mixing the waste substances with at least one additive to form a mixed batch,

generating a gall layer of alkali salt or alkaline earth salt on the surface of a glass melt heated solely by electrodes, and

introducing the mixed batch onto said glass melt surface so that a major portion is melted into the melt and a minor portion produces an exhaust gas emerging from the melt, said gall layer serving as a melt accelerator,

introducing the exhaust gas into the batch to be melted, thereby cooling said gas and producing condensation products in the batch, and

reintroducing said condensation products into the melt with the batch.

4,944,786

APPARATUS FOR MANUFACTURING THERMAL PRINT HEAD

Goro Oda; Niro Nagata; Yoshitsugu Nakatomi, all of Kanagawa; Takashi Sawafuji, Tokyo; Yoshihisa Shinozaki, Saitama, and Eizo Goto, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 161,368, Feb. 22, 1988, which is a continuation of Ser. No. 937,483, Dec. 3, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 220,064

Claims priority, application Japan, Dec. 26, 1985, 60-292044

Int. Cl.[5] C03B *29/04, 5/02*; C03C *27/02*

U.S. Cl. 65—154 **5 Claims**

1. An apparatus for forming a glass glaze layer on an elongated base, comprising:

a furnace having a space to accommodate molten glass therein;

a pair of opposed electrodes disposed within said furnace with their opposed faces inclined such that the distance between them is smallest at their upper ends, and said distance increases towards their lower ends, said electrodes extending to the surface of the molten glass;

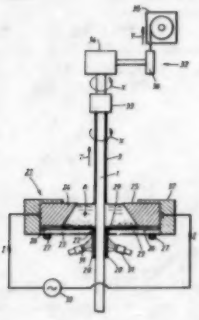
means for supplying electric power across the electrodes;

said furnace defining an opening provided at the bottom of

said furnace to allow the base inserted therethrough parallel to the direction of elongation of the base;

means for withdrawing the base inserted in said opening as the base passes through the molten glass, said withdrawing means including:

means for gripping the top end of the base,



means for rotating said gripping means, and

means for lifting said rotating means and gripping means upward; and

means for cooling the molten glass at the bottom of said furnace.

4,944,787

THERMALLY STABLE UREA-SULFURIC ACID COMPOSITIONS AND METHODS OF MANUFACTURE

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 442,296, Nov. 11, 1982, abandoned, which is a continuation-in-part of Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925. This application Nov. 20, 1984, Ser. No. 673,508

Int. Cl.[5] C05C 9/00

U.S. Cl. 71—28 **78 Claims**

1. A thermally stable composition comprising urea and sulfuric acid which composition contains about 1 weight percent water or less based on the combined weight of said urea and said sulfuric acid.

4,944,788

SUBSTITUTED NITRO AND CYANOGUANIDINES AND THEIR USE FOR INCREASING CROP YIELDS

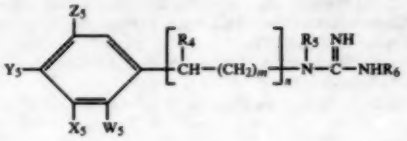
Laurine M. Speltz, Princeton; Bryant L. Walworth, Pennington, and Alexander D. Pavlista, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 835,847, Mar. 3, 1986, Pat. No. 4,804,780, which is a division of Ser. No. 551,611, Nov. 17, 1983, Pat. No. 4,594,092, which is a continuation-in-part of Ser. No. 451,698, Dec. 20, 1982, abandoned. This application Dec. 1, 1988, Ser. No. 278,709

Int. Cl.[5] A01N 43/16, 37/06; C07D 309/12; C07C 63/06

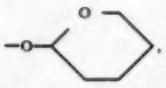
U.S. Cl. 71—88 **17 Claims**

1. A method for increasing crop yield of underground step crops, underground stem ornamentals, root crops, graminaceous crops, forage crops, tomatoes, tabacco, sunflowers, cucurbits, cotton, and epigynous fruits, said method comprising: applying to the foliage thereof or to soil containing the seeds or other propagating organs thereof, a crop-yield enhancing amount of a compound having the following structural formula,



(V)

wherein W_5 is H, F or Cl; X_5 is H, straight or branched C_1–C_4 alkyl, halogen, CN, NO_2, CH_2CN. $OCHF_2$, OCF_2CHF_2, OCF_3, CF_3, C_1–C_4 alkoxy,



tetrahydro-2H-pyran-2-yl, OH, $C(OH)_2CF_3$, SCH_3, $COCH_3$, $N(CH_3)_2$, $COOCH_3$ or CH_2OR_3 where R_3 is H or CH_3; Y_5 is H, OH, OCH_3, CH_3 or halogen; Z_5 is H, CH_3, halogen, OCH_3 or CF_3; R_4 is H, CH_3 C_2H_5 or CF_3; R_5 is H or CH_3; R_6 is NO_2 or CN; m is an integer of 0, 1 or 2; n is an integer of 0 or 1; and the salts or tautomers thereof.

4,944,789

AZETIDINE DERIVATIVE AND THEIR USE FOR REGULATING PLANT GROWTH

Costin Rentzea, Heidelberg; Wilhelm Rademacher; Johann Jung, both of Limburgerhof, and Albrecht Harreus, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

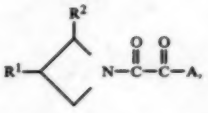
Filed Jul. 7, 1989, Ser. No. 376,994

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824052; May 19, 1989, 3916364

Int. Cl.[5] A01N 43/34; C07D 205/04

U.S. Cl. 71—88 **5 Claims**

1. Azetidine compound of the formula I



(I)

where R^1 and R^2 are each hydrogen or C_1–C_3-alkyl, A is $-XR^3$ or $-N(R^5)-OR^4$, X is oxygen or sulfur, R^3 is C_1–C_{20}-alkyl, C_1–C_{20}-haloalkyl, C_3–C_{18}-alkenyl, C_3- or C_4-alkynyl, bridged C_3–C_{12}-cycloalkyl or C_4–C_{12}-alkylcycloalkyl, the cycloalkyl radicals or alkylcycloalkyl radicals being unsubstituted or substituted by C_1–C_5-alkyl or cyclohexyl, R^4 is C_1–C_{20}-alkyl, C_1–C_{12}-haloalkyl, C_1–C_6-cyanoalkyl, C_1–C_{12}-alkoxyalkyl, C_3–C_{18}-alkenyl, C_3–C_{18}haloalkenyl, C_3- or C_4-alkynyl, C_3–C_{12}-cycloalkyl or C_4–C_{12}-cycloalkylalkyl, C_3–C_1-6alkoxycarbonylalkyl or C_7–C_{20}-aralkyl being unsubstituted or substituted on the aromatic group by halogen, nitro, halo-C_1–C_4-alkyl, C_1–C_4-alkyl or C_1–C_4-alkoxy, and R^5 is hydrogen or C_1–C_3-alkyl.

4. A process for regulating plant growth, wherein the soil, the plants or the seed are treated with an azetidine compound of the formula I as set forth in claim 1.

5. A process for regulating plant growth, wherein an effective amount of at least one azetidine compound of the formula I as set forth in claim 1 is allowed to act on plants or their habitat.

4,944,790

1,5-DIPHENYLPYRAZOLE-3-CARBOXYLIC ACID DERIVATIVES FOR THE PROTECTION OF CULTIVATED PLANTS

Hans Moser, Magden; Beat Böhner, Binningen, and Werner Füry, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

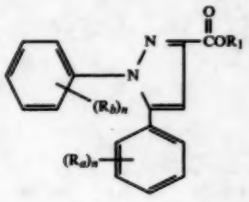
Division of Ser. No. 109,667, Oct. 16, 1987. This application Mar. 20, 1989, Ser. No. 325,833

Claims priority, application Switzerland, Oct. 22, 1986, 4215/86; Oct. 22, 1986, 4217/86

Int. Cl.[5] A01N *43/60, 43/56;* C07D *405/12, 403/12*

U.S. Cl. 71—92 8 Claims

1. A 1,5-diphenylpyrazole-3-carboxylic acid of the formula:



in which R_1 is

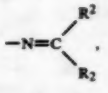
(i) hydrogen;

(ii) a plant-physiologically acceptable metal or ammonium cation;

(iii) an unsubstituted, monosubstituted or polysubstituted alkyl group of 1 to 18 carbon atoms or cycloalkyl group of 3 to 18 carbon atoms in which the substituents are selected from the group consisting of alkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, cycloalkenyl of 3 to 8 carbon atoms, halo, nitro, cyano, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms, alkylcarbonyl of 1 to 4 carbon atoms, carbamoyl, dialkylcarbamoyl in which each alkyl group has 1 to 4 carbon atoms, amino, alkylamino of 1 to 4 carbon atoms, and dialkylamino in which each alkyl group has 1 to 4 carbon atoms;

(iv) the group -U in which U is unsubstituted, monosubstituted or polysubstituted phenyl or naphthyl in which the substituents are selected from the group consisting of halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, cyano, nitro, carboxy, alkoxycarbonyl of 1 to 4 carbon atoms, alkylcarbonyl of 1 to 4 carbon atoms, carbamoyl, alkylcarbamoyl of 1 to 4 carbon atoms, dialkylcarbamoyl wherein each alkyl group has 1 to 4 carbon atoms, sulfamoyl, alkylsulfamoyl of 1 to 4 carbon atoms, dialkylsulfamoyl wherein each alkyl group has 1 to 4 carbon atoms, pyrrolidino, piperidino, pyrrolidinocarbonyl, piperidinocarbonyl, and morpholinocarbonyl;

(v) the group -EU in which U is as herein defined and E is alkylene of 1 to 4 carbon atoms, alkenylene of 2 to 4 carbon atoms, or alkynylene of 2 to 4 carbon atoms; or



(vi)

in which each R_2, independently of the other, is alkyl of 1 to 4 carbon atoms or cycloalkyl of 3 to 7 carbon atoms or together with the carbon atom to which they are bound are a saturated carbocylic ring of 5 to 7 carbon atoms, unsubstituted or substituted with one or more alkyl groups totaling no more than 6 carbon atoms;

each n, independently of the other, has a value of 1 to 3;

R_b is halo, alkyl of 1 to 5 carbon atoms, haloalkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, cyano or alkoxy; and

R_a is hydrogen, halo, alkyl of 1 to 5 carbon atoms, haloalkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, alkynyl of 2 to 5 carbon atoms, alkoxy or cyano, with the proviso that when R_a is hydrogen, R_1 is hydrogen or ethyl, and R_b is methyl or halo, R_b is in the ortho position.

8. A composition for protecting cultivated plants from the phytotoxic action of herbicidally active 2-[4-(phenoxy, pyridin-2-yloxy, benzoxazolyloxy, benzthiazolyloxy and quinoxalin-2-yloxy)-phenoxy]-propionic acid esters, which contains besides inert carrier material as active ingredient a herbicidally antagonistic effective amount of a 1,5-diphenylpyrazole-3-carboxylic acid derivative according to claim 1.

4,944,791

HERBICIDAL HYDANTOINS

Ludwig Schröder, Ingelheim; Werner Stransky, Gau-Algesheim; Rudolf Mengel, Ingelheim, all of Fed. Rep. of Germany; Erich Raddatz, Cali, Colombia; Sigmund Lust, Darmstadt; Gerbert Linden, Ingelheim, and Gerhart Schneider, Mühltal, all of Fed. Rep. of Germany, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

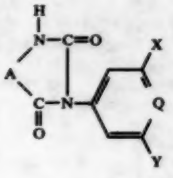
Continuation of Ser. No. 157,903, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 46,622, May 4, 1987, abandoned, which is a continuation of Ser. No. 856,825, Apr. 18, 1986, abandoned, which is a continuation of Ser. No. 774,901, Sep. 11, 1985, abandoned, which is a continuation of Ser. No. 623,961, Jun. 25, 1984, abandoned, which is a continuation of Ser. No. 492,946, May 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 479,709, Mar. 28, 1983, abandoned. This application Dec. 14, 1988, Ser. No. 284,093

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213140; Oct. 16, 1982, 3238447; Jan. 14, 1983, 3301008

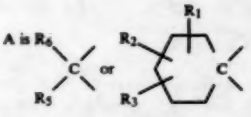
Int. Cl.[5] A01N *43/50, 43/52;* C07D *401/04*

U.S. Cl. 71—92 13 Claims

1. A compound of the formula



wherein Q is —CH= or —N=;



R_1, R_2 and R_3 are each independently hydrogen or alkyl of 1 to 4 carbon atoms, at least one of R_1, R_2 and R_3 being hydrogen; R_4 and R_5 are each independently alkyl of 1 to 4 carbon atoms or cycloalkyl of 3 to 6 carbon atoms; provided that at least one of them is C_3-alkyl or C_3-cycloalkyl; and X and Y are halogen, with the proviso that Q is not —CH= when A is

4,944,792

N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen; Werner Föry, Basle, and Karl Gass, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

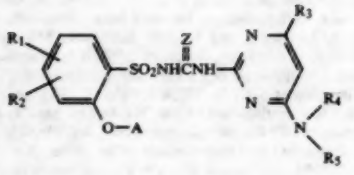
Division of Ser. No. 430,635, Sep. 30, 1982, Pat. No. 4,579,584. This application Jan. 16, 1986, Ser. No. 819,431

Claims priority, application Switzerland, Oct. 13, 1981, 6541/81

Int. Cl.[5] C07D *239/48*; A01N *43/54*

U.S. Cl. 71—92 25 Claims

1. A compound selected from the group consisting of a pyrimidinylsulfonylurea of the formula:



wherein

Z is O or S;

A is (i) alkynyl of 3 to 6 carbon atoms, (ii) an alkyl group of 1 to 6 carbon atoms substituted with halo, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, haloalkyl sulfinyl or haloalkylsulfonyl; or (iii) an alkenyl group of 2 to 6 carbon atoms which is unsubstituted or substituted with halo, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, haloalkyl sulfinyl or haloalkylsulfonyl;

R_1 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or R_6—Y—

in which

Y is O, S, SO, or SO_2 and

R_6 is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or alkynyl of 2 to 6 carbon atoms;

R_2 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, haloalkyl of 1 to 4 carbon atoms, R_5—Y—, nitro, R_7OCO—, or R_8R_9NCO—,

in which

Y and R_6 are as defined above;

R_7 is an alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and

each of R_8 and R_9 is independently hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or alkynyl of 2 to 6 carbon atoms;

R_3 is hydrogen, halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, or alkoxyalkyl of up to 4 carbon atoms;

R_4 is hydrogen, methyl, or ethyl; and

R_5 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, methoxymethyl, cyanomethyl, or cyanoethyl; and the salts thereof.

12. A herbicidal and growth-regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

4,944,793

N-PHENYLSULFONYL-N-TRIAZINYLUREAS

Willy Meyer, Riehen; Werner Föry, Basel, and Karl Gass, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

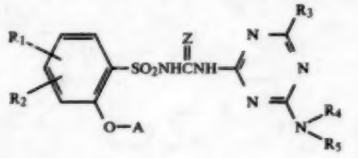
Continuation-in-part of Ser. No. 430,635, Sep. 30, 1982, Pat. No. 4,579,584. This application Sep. 19, 1985, Ser. No. 777,899

Claims priority, application Switzerland, Oct. 13, 1981, 6541/81

Int. Cl.[5] A01N *43/68, 43/70*; C07D *251/18, 251/52*

U.S. Cl. 71—93 23 Claims

1. A compound selected from the group consisting of a triazinylsulfonylurea of the formula:



wherein z is O or S;

A is alkynyl of 3 to 6 carbon atoms;

R_1 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or R_6—Y—in which Y is O, S, SO or SO_2; and

R_6 is an alkyl, alkenyl, or alkynyl group of up to 5 carbon atoms;

R_2 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, haloalkyl of 1 to 4 carbon atoms, R_5—Y—, nitro, R_7OCO—, or R_8R_9NCO—, in which Y and R_6 are as defined above;

R_7 is an alkyl, alkenyl, or alkynyl group of up to 5 carbon atoms; and each of R_8 and

R_9 are hydrogen or an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_3 is hydrogen, halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, or alkoxyalky of up to 4 carbon atoms;

R^4 is hydrogen, methyl, or ethyl; and

R_5 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, methoxymethyl, cyanomethyl, or cyanoethyl; and the salts thereof.

14. A herbicidal and growth-regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

4,944,794

N-PHENYLSULFONYL-N-TRIAZINYLUREAS

Willy Meyer, Riehen; Werner Föry, Basel, and Karl Gass, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

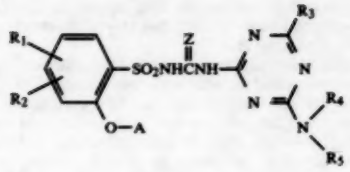
Continuation-in-part of Ser. No. 430,635, Sep. 30, 1982, Pat. No. 4,579,584. This application Sep. 19, 1985, Ser. No. 777,900

Claims priority, application Switzerland, Oct. 13, 1981, 6541/81

Int. Cl.[5] A01N *43/68, 43/70*; C07D *251/18, 251/52*

U.S. Cl. 71—93 19 Claims

1. A compound selected from the group consisting of a triazinylsulfonylurea of the formula:



wherein Z is O or S;

A is haloalkyl of 1 to 6 carbon atoms;

R_1 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or R_6—Y— in which Y is O, S, SO, or SO_2 and R_6 is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms;

R_2 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, haloalkyl of 1 to 4 carbon atoms, R_5—Y—, nitro, R_7OCO—, or R_8R_9NCO—, in which Y and R_6 are as defined above;

R_7 is an alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and each of R_8 and R_9 is independently hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms of alkynyl of 2 to 6 carbon atoms;

R_3 is hydrogen, halo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, haloalkoxy of 1 to 4 carbon atoms, or alkoxyalkyl of up to 4 carbon atoms;

R_4 is hydrogen, methyl, or ethyl; and

R_5 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, methoxymethyl, cyanomethyl, or cyanoethyl; and the salts thereof.

10. A herbicidal and growth-regulating composition which comprises an effective amount of at least one compound according to claim **1**, together with a suitable carrier therefor.

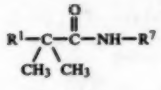
4,944,795

3-BUTENANILIDES

Gary D. Crouse, Indianapolis, and Jeffery D. Webster, New Palestine, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 30, 1989, Ser. No. 428,557
Int. Cl.[5] A01N *31/14*; C07C *233/08*
U.S. Cl. 71—98 **17 Claims**

1. A compound of the formula (1)



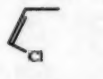
(1)

wherein R^1 is

(a)

(E)

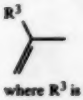
where R^2 is F, Cl, Br, I, SCH_3, or OCH_3,



(b)

(Z)

-continued



(c)

where R^3 is F, Cl, or Br,

(d)

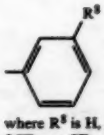
where R^4 and R^5 are both Cl or both Br, or

(e)

(Z)

where R^6 is F, Cl, or Br; and

R^7 is

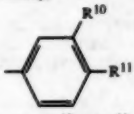


(a)

where R^8 is H, F, Cl, Br, I, SCF_3, or CF_3,

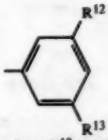
(b)

where R^9 is F, Cl, Br, I, SCF_3, $SOCF_3$, SO_2CF_3, halo (C_1–C_3) alkyl, (C_1–C_3) alkoxy, halo (C_1–C_3) alkoxy,



(c)

where R^{10} and R^{11} are independently F, Cl, Br, SCH_3, or CF_3; or



(d)

where R^{12} and R^{13} are both F or both Cl.

15. A herbicide composition comprising as active ingredient a compound of claim **1** in combination with an agriculturally acceptable carrier.

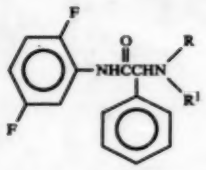
4,944,796

CERTAIN 2-(DISUBSTITUTED AMINO) ACETANILIDE HERBICIDES

Siok-Hai H. Wee, Berkeley, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 14, 1988, Ser. No. 270,573
Int. Cl.[5] A01N 37/26; C07C 103/64, 103/82
U.S. Cl. 71—118 26 Claims

1. A compound having the formula

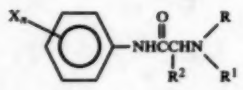


wherein

R is C_1–C_3 alkyl or phenyl;

R^1 is selected from the group consisting of amino, substituted carbonyl wherein said substituent is C_1–C_4 alkylthio, carboxy, phenylthio, or C_1–C_4 alkylamino; and C_2–C_4 alkylthio thiocarbonyl.

17. A method of controlling undesirable vegetation comprising applying to said vegetation or to the locus thereof a herbicidally effective amount of a compound having the formula



wherein

R is C_1–C_3 alkyl or phenyl;

R^1 is selected from the group consisting of amino, C_1–C_4 alkyl, allyl, substituted carbonyl wherein said substituent is C_1–C_4 haloalkyl, C_2–C_4 alkoxycarbonyl, C_1–C_4 alkylthio, carboxy, C_1–C_5 alkoxy, C_1–C_4 alkyl, vinyl, haloanilino, phenylthio, C_1–C_4 alkylamino, benzylamino, C_3–C_6 alkoxycarbonylalkyl or substituted carbamyl wherein the substituent is C_1–C_2 alkyl halocarbanilide; C_2–C_4 alkylthio thiocarbonyl; mono-haloanilino carbonylmethylene, C_1–C_3 alkoxy carbonylmethylene, and carboxymethylene;

R^2 is phenyl;

X is halo or C_1–C_2 haloalkyl; and

n is an integer selected from 1–3 inclusive.

4,944,797

LOW OXYGEN CONTENT FINE SPHERICAL COPPER PARTICLES AND PROCESS FOR PRODUCING SAME BY FLUID ENERGY MILLING AND HIGH TEMPERATURE PROCESSING

Preston B. Kemp, Jr., Troy, N.Y., and Walter A. Johnson, Houghton, Mich., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,790
The portion of the term of this patent subsequent to Nov. 8, 2205, has been disclaimed.
Int. Cl.[5] B22F 9/04
U.S. Cl. 420—469 9 Claims

1. A process for producing fine spherical copper powder particles, said process comprising:

(a) reducing the size of a electrolytically produced starting dendritic copper powder material by fluid energy milling to produce a finer powder, essentially all of which has a particle size of less than about 20 micrometers in diameter;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder said temperature being from about 5500° C. to about 17,000° C., to melt at least about 50% by weight of said finer powder to form essentially fine spherical particles of said melted portion; and

(c) rapidly and directly resolidifying the resulting high temperature treated material while said material is in flight, to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends, said particles having an oxygen content of less than about 0.5% by weight, and a carbon content of no greater than the carbon content of said starting material.

6. A powder material consisting essentially of spherical copper particles, said powder material being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends, said powder material having a particle size of less than about 20 micrometers in diameter, said powder material being made by jet milling a starting electrolytically produced material which is dendritic copper powder in the dry state with an inert gas by impacting the particles of said starting material against each other to fracture said particles of said starting material, followed by high temperature processing and direct solidification of the resulting high temperature treated material, said powder material having an oxygen content of less than about 0.5% by weight and a carbon content of no greater than the carbon content of said starting material.

4,944,798

METHOD OF MANUFACTURING CLEAN STEEL

Tohei Ototani, Tokyo, Japan, assignor to Metal Research Corporation, Tokyo, Japan

Filed Jun. 7, 1989, Ser. No. 363,570
Claims priority, application Japan, Feb. 1, 1989, 1-20817
Int. Cl.[5] C21C 7/02
U.S. Cl. 420—85 5 Claims

1. A method of manufacturing clean steel comprising refining molten steel by adding additives of from not more than 0.5% to more than 0.001% by weight additives of from not more than 0.5% to more than 0.001% by weight of molten steel to the molten steel bath; said additives being Al together with at least one element selected from the group consisting of Ti, Nb, Ta, B and alkali earth metal in vacuo or a non-oxidizing atmosphere within a melting furnace or vessel made of or lined with a basic main refractory material consisting essentially of 7–90 wt% of CaO and 90–7 wt% of MgO, wherein the total content of CaO and MgO is 70% to 99.9%, and wherein there is included another refractory material consisting of 30–0.1 wt% of at least one element selected from the group consisting of Al_2O_3, CrO, $ZrO_2.SiO_2$, ZrO_2O, SiO_2, ZrC and C as supplemental components, and obtaining clean steel containing less than 30 ppm of oxygen, less than 30 ppm of sulfur, less than 150 ppm of nitrogen, 5 to 0.1 ppm of Mg and 25 to 0.1 ppm of Ca.

4,944,799

METHOD OF PRODUCING STAINLESS MOLTEN STEEL BY SMELTING REDUCTION

Haruyoshi Tanabe; Masahiro Kawakami; Kenji Takahashi; Katsuhiro Iwasaki, and Shigeru Inoue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

PCT No. PCT/JP88/00910, § 371 Date Apr. 25, 1989, § 102(e) Date Apr. 25, 1989, PCT Pub. No. WO89/02478, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 9, 1988, Ser. No. 362,418
Claims priority, application Japan, Sep. 10, 1987, 62-225254; Sep. 10, 1987, 62-225255; Sep. 17, 1987, 62-231042; Nov. 13, 1987, 62-285444; Dec. 25, 1987, 62-330979
Int. Cl.[5] C21C 5/32, 5/34
U.S. Cl. 75—501 20 Claims

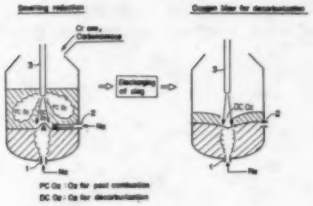
1. A method of producing stainless molten steel by smelting reduction in a smelting reduction furnace comprising a bottom

tuyere, a side tuyere, and a top lance comprising a first outlet and a second outlet; said method comprising the steps of

reducing raw chromium ore in said furnace by use of carbonaceous material to produce chromium molten metal at the bottom of said furnace and having slag above said molten metal;

blowing CO and/or inert gas through said bottom tuyere into said molten metal to cause agitation thereof;

blowing CO and/or inert gas through said side tuyere into said molten metal so as to contact said agitated molten metal;



concurrently blowing decarburizing oxygen through said first outlet of said top lance into said molten metal and post combustion oxygen through said second outlet of said top lance into said slag, so that said molten metal is decarburized;

reducing chromium material by maintaining a ratio of post combustion to be more than 0.3;

discharging said slag after completion of reduction; and

after discharging of the slag concurrently blowing a decarburizing oxygen diluted with an inert gas through one of said outlets of said top lance into said molten metal and blowing an inert gas through said bottom tuyere into said molten metal so as to agitate forcibly said molten metal.

4,944,800

PROCESS FOR PRODUCING A SINTERED HARD METAL BODY AND SINTERED HARD METAL BODY PRODUCED THEREBY

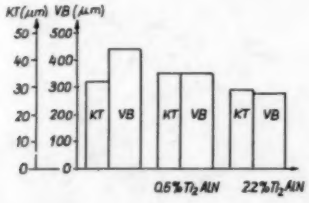
Hans Kolaska, Bottrop, Fed. Rep. of Germany, and Peter Ettmayer, Vienna, Austria, assignors to Krupp Widia GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 318,177

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1988, 3806602

Int. Cl.[5] C22C *29/04*

U.S. Cl. 75—238 **24 Claims**



1. A process for producing a sintered hard metal body, comprising:

mixing together at least one hard substance, at least one binder material, and at least one of at least one complex carbide and at least one complex nitride to form a starting mixture each constituent of which is in powdered form,

wherein the at least one hard substance is selected from the group consisting of carbides, nitrides, and carbonitrides of transition metals of Groups IVB, VB and VIB of the Periodic Table of Elements, is present as at least one of a carbide, a mixed carbide, a nitride, a mixed nitride, a carbonitride, and a mixed carbonitride, and has a cubic crystal form, and

wherein the at least one binder metal is selected from the group consisting of iron, nickel and cobalt;

grinding the starting mixture;

compressing the starting mixture, after grinding same, into a predetermined shape; and

sintering the starting material, after compressing same, to melt the at least one binder metal and decompose the at least one of at least one complex carbide and at least one complex nitride to form at least one of at least one transition metal carbide and at least one transition metal nitride, which at least one of at least one transition metal carbide and at least one transition metal nitride grows on the surface of the at least one hard substance in powdered form and forms a diffusion inhibiting layer thereon.

4,944,801

PROCESS FOR PREPARING POWDER OF AN ALLOY OF A RARE EARTH ELEMENT, IRON AND BORON FOR A RESIN BONDED MAGNET

Takashi Ishikawa; Nobumitsu Oshimura, and Kenji Ohmori, all of Ichikawa, Japan, assignors to Sumitomo Metal Mining Co. Ltd., Japan

Filed Jul. 5, 1989, Ser. No. 375,459

Claims priority, application Japan, Jul. 7, 1988, 63-167727

Int. Cl.[5] H01F *1/053, 1/09*

U.S. Cl. 75—349 **6 Claims**

1. A process for preparing a powder of an alloy of a rare earth element, iron and boron used for making a magnet with a resin, comprising:

mixing a powder of a rare earth oxide or a powder of a rare earth oxide and a rare earth metal, a powder containing iron, a powder containing boron, and at least one material selected from the group consisting of an alkali metal, an alkaline earth metal and a hydrogenated product thereof;

heating their mixture to a temperature of 900° C. to 1200° C. in a non-oxidizing atmosphere;

crushing said mixture coarsely;

heating said mixture to a temperature of 650° C. to 1100° C.;

subjecting said mixture to wet treatment, whereby an alloy powder is obtained; and

pulverizing said powder into a finer powder having an average particle diameter of 1 to 10 microns.

4,944,802

HIGH COERCIVITY MAGNETIC INKS AND METHOD FOR MAKING SAME

Mark S. Chagnon, Lowell, and John R. Ferris, Newburyport, both of Mass., assignors to Omni Quest Corporation, Atkinson, N.H.

Filed Sep. 16, 1988, Ser. No. 245,330

Int. Cl.[5] C09D *11/02*

U.S. Cl. 106—20 **26 Claims**

1. A method for producing a magnetic ink comprising: combining barium ferrite powder, an inorganic oxide, a blend of a polyurethane polymer and a vinylchloride-vinyl acetate copolymer, an organic solvent and a surface active agent of the general structure R"—R'—R—YH wherein: R" is a solubilizing tail of similar solubility parameter to a mixture of the organic solvent and the polymer blend; R' is a double bond, ether linkage, secondary amine, phenyl ring, phosphate ester or sulfide linkage; R is an aliphatic chain about C_4 to C_{20} in length; and YH is COOH, NH_2, PO_3H, SO_3H or OH.

4,944,803

CATALYST-CONTAINING COATING TO PROMOTE RAPID CURING POLYURETHANE LACQUERS

Wayne A. Kraus, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 24, 1988, Ser. No. 172,615
Int. Cl.[5] C08L 1/18; C09K 3/00
U.S. Cl. 106—203 4 Claims

1. A cure coat composition for application over a coating of a two component polyurethane lacquer that is in a wet or semi-dry state, said cure coat composition consisting essentially of (1) from about 0.5% to about 20% of a hydroxy functional polymer, (2) from about 99.4% to about 70% of a solvent for the hydroxy functional polymer, and (3) from about 0.1% to about 10% of a catalyst for the reaction of the hydroxyl groups of the hydroxy functional polymer with isocyanate groups of the polyurethane lacquer to form urethane linkages, all percentages being by weight based on the total weight of the composition.

4,944,804

PLASTER OF PARIS (STUCCO) AS MIXING AID FOR AQUEOUS BITUMINOUS EMULSION AGGREGATE SLURRIES

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 31, 1988, Ser. No. 265,268
Int. Cl.[5] C08L 95/00
U.S. Cl. 106—277 8 Claims

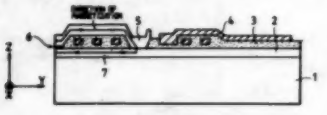
1. An improved bituminous emulsion-aggregate paving slurry comprising aggregate and from about 15% to about 25%, based on the weight of the aggregate, of a bituminous emulsion comprised of from about 30% to about 80%, based on the weight of the emulsion, of bitumen, from about 0.2% to about 10%, based on the weight of the emulsion, of an emulsifier selected from the group of cationic and anionic emulsifiers, and water to make up 100%, based on the weight of the emulsion, wherein the improvement comprises extended mixing time and improved adhesion of the bitumen to the aggregate after evaporation of the water by the addition to the slurry of from about 0.1% about 2%, based on the weight of the aggregate, of calcium sulfate hemihydrate.

4,944,805

METHOD OF HEAT TREATMENT AMORPHOUS SOFT MAGNETIC FILM LAYERS TO REDUCE MAGNETIC ANISOTROPY

Kanji Nakanishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1988, Ser. No. 243,533
Claims priority, application Japan, Sep. 10, 1987, 62-225167; Sep. 10, 1987, 62-225168
Int. Cl.[5] C21D 1/04
U.S. Cl. 148—108 18 Claims



1. In a method of heat treating an amorphous soft magnetic film fabricated by depositing various layers of material on a substrate including at least two layers of amorphous soft magnetic film, the improvement in combination therewith comprising the steps of:

performing a heat treatment, after each layer of said amorphous soft magnetic film has been deposited, at a temperature lower than the crystallization temperature and the Curie point of said amorphous soft magnetic film, while applying a static magnetic field in a first direction generally perpendicular to a second direction in which a high permeability for high frequency is desired in said amorphous soft magnetic film of said fabricated device relative to the permeability for high frequency in said first direction;

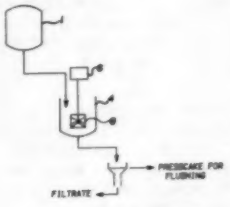
performing a final heat treatment, after all of the layers of said amorphous soft magnetic film have been deposited, at a temperature equal to or lower than the temperature for the heat treatment previous to the final heat treatment, while applying a static magnetic field in said second direction, and controlling at least one of the temperature and duration of the final heat treatment so as to control the magnitude of a uniaxial magnetic anisotropy to be imparted to said amorphous soft magnetic film.

4,944,806

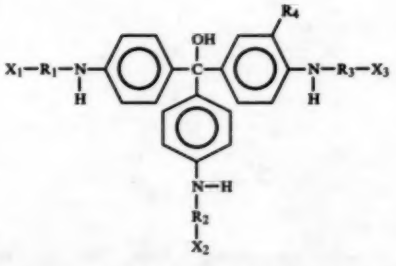
PIGMENTARY SALT OF A TRIPHENYLMETHANE COMPOUND AND PROCESS FOR MAKING SAME

Anand S. G. Sharangpani; Floyd G. Spence, both of Holland, and Brian D. Teunis, Grand Haven, all of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Dec. 28, 1987, Ser. No. 138,323
Int. Cl.[5] C08K 5/00
U.S. Cl. 106—493 15 Claims



1. A resin-free pigmentary salt of a triphenylmethane compound, wherein the triphenylmethane compound has the following structure:



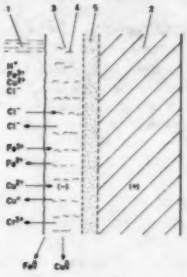
and wherein R_1, R_2 and R_3 are direct linkages, phenyl, or napthyl groups; R_4 is hydrogen or methyl; X_1, X_2 and X_3 are hydrogen, halogen, alkyl of 1 to 4 carbons or alkoxy of 1 to 4 carbons; provided that at least one of R_1, R_2 and R_3 is not a direct linkage and provided that X_1, X_2 and X_3 is hydrogen when the corresponding R_1, R_2 or R_3 is a direct linkage.

4,944,807

PROCESS FOR CHEMICALLY STRIPPING A SURFACE-PROTECTION LAYER WITH A HIGH CHROMIUM CONTENT FROM THE MAIN BODY OF A COMPONENT COMPOSED OF A NICKEL-BASED OR COBALT-BASED SUPERALLOY

Vladimir Sova, Remetschwil, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Nov. 30, 1988, Ser. No. 278,327
Claims priority, application Switzerland, Dec. 1, 1987, 4675/87
Int. Cl.[5] C23G 1/04
U.S. Cl. 134—3 8 Claims



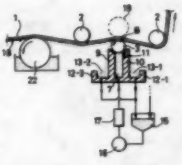
1. A process for chemically stripping a surface-protection layer with a high chromium content from a main body of a component composed of a nickel-based or cobalt-based superalloy, comprising immersing the component for a time of 1 h to 150 h at a temperature in the range from 50° to 70° C. in an aqueous chloride solution which does not release oxygen, which contains iron (III) and copper (II) and which contains still further additives, but no components of any kind which form chromium oxide.

4,944,808

METHOD OF REMOVING PARTICLES FROM A FLEXIBLE SUPPORT, AND APPARATUS FOR PRACTICING SAME

Tuyoshi Sugiyama; Hideo Takeda; Tsunehiko Sato, and Hiroshi Chikamasa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 28, 1986, Ser. No. 901,500
Claims priority, application Japan, Sep. 12, 1985, 60-200662; Sep. 12, 1985, 60-200663
Int. Cl.[5] B08B 3/00
U.S. Cl. 134—15 3 Claims



1. A cleaning method of removing foreign particles from a flexible sheet, comprising the steps of:

running a flexible sheet in a first direction adjacent a rod member, said rod member having an outer cylindrical surface;

applying a solvent onto said flexible sheet upstream of said rod member;

rotating said rod in a direction opposite to said first direction, whereby particles on said flexible sheet are transferred from substantially an entire width of said flexible sheet to said outer cylindrical surface; and

separating said particles from said outer cylindrical surface.

4,944,809

METHOD AND APPARATUS FOR VACCUM CLEANING A PILE OF MINERAL WOGL PLATES

Ingemar Öhberg, Skövde, Sweden, assignor to Rockwool Aktiebolaget, Skövde, Sweden

Filed Mar. 21, 1989, Ser. No. 326,316
Claims priority, application Sweden, Mar. 31, 1988, 8801206
Int. Cl.[5] B08B 5/04
U.S. Cl. 134—21 17 Claims

1. A method for manufacturing individual plates (3) from a mineral wool mat having main planar surfaces to minimize the spread of loose fibers and other particles from said plates comprising the steps of

A. cutting said mat into individual plates each having marginal edges of the same length and end edges of the same width with each of said edges presenting an edge surface;

B. placing said main surfaces of each plate into aligned face-to-face relation with those of adjacent plates to form a pile which has four sides each composed of a plurality of said mineral wool edge surfaces;

C. establishing a vacuum cleaning slot means for withdrawing and exhausting air from areas closely adjacent said sides of said pile; and

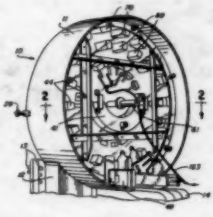
D. causing relative movement between said pile and said vacuum cleaning slot means to vacuum clean said sides of said pile.

4,944,810

BOTTLE WASHER USING A 360 DEGREE ARC AND EXTENDED PADDLES TO CONTROL THE BOTTLES' MOVEMENT

William J. McBrady, 2902 Bob-O-Link Rd., Flossmoor, Ill. 60422

Division of Ser. No. 106,627, Oct. 6, 1987, Pat. No. 4,834,123. This application Apr. 18, 1989, Ser. No. 339,707
Int. Cl.[5] B08B 9/00
U.S. Cl. 134—23 4 Claims



1. A method for cleaning bottles moving along a first route on a conveyor comprising:

(A) directing bottles on said conveyor off said conveyor at a particular location;

(B) moving said bottles directed off of said conveyor along a second route different than said first route and including

a plurality of substantially 360 degree rotations in adjacent separate planes about an axis, each of said substantially 360 degree rotations occurring in a single plane;

(C) cleaning said bottles while moving along said second route;

(D) for each one of said rotations, guiding said bottles beginning said one rotation along a first path and said bottles ending said one rotation along a second path and maintaining said first and second paths clear of each other; and

(E) replacing said bottles moved along said second route on said conveyor.

4,944,811

MATERIAL FOR LIGHT EMITTING ELEMENT AND METHOD FOR CRYSTAL GROWTH THEREOF

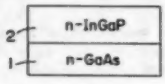
Tokuzo Sukegawa, Hamamatsu, and Kazuyuki Tadatomo, Itami, both of Japan, assignors to Tokuzo Sukegawa, Shizuoka and Mitsubishi Cable Industries, Ltd., Hyogo, both of, Japan

Continuation of Ser. No. 71,254, Jul. 8, 1987, abandoned. This application Aug. 9, 1989, Ser. No. 391,391

Claims priority, application Japan, Jul. 16, 1986, 61-167504; Jul. 16, 1986, 61-167505; Jul. 16, 1986, 61-167506; Jul. 16, 1986, 61-167507; Jul. 16, 1986, 61-167508

Int. Cl.[5] H01L *21/20, 21/208, 29/00, 29/06*

U.S. Cl. 148—33.1 **4 Claims**



1. A material for a light emitting element of at least a two-layered structure comprising a gallium arsenide (GaAs) substrate and a tin (Sn) doped indium gallium phosphide (InGaP) layer whose mixed crystal composition expressed by the molar fraction (x) of gallium phosphide (GaP) is 0.63 to 0.74, wherein a solution comprising Sn as a solvent is used in forming an sn doped InGaP layer on the GaAs substrate.

4,944,812

TANNIN MANNICH ADDUCTS FOR IMPROVING CORROSION RESISTANCE OF METALS

Andreas Lindert, Troy, and Stephen M. Wolpert, Detroit, both of Mich., assignors to Henkel Corporation, Ambler, Pa.

Filed Nov. 16, 1988, Ser. No. 272,172

Int. Cl.[5] C23C *32/82*

U.S. Cl. 148—251 **21 Claims**

1. An aqueous metal treatment solution comprising from about 0.01 g/liter to about 50 g/liter of the condensation reaction product of a vegetable tannin, an aldehyde and an amine.

4,944,813

PROCESS FOR PHOSPHATING METAL SURFACES

Kurt Hosemann, Titz, and Reinhard Opitz, Dueren, both of Fed. Rep. of Germany, assignors to Gerhard Collardin GmbH, Koeln-Ehrenfeld, Fed. Rep. of Germany

Filed Jan. 13, 1989, Ser. No. 297,155

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800835

Int. Cl.[5] C23C *22/12*

U.S. Cl. 148—260 **16 Claims**

1. In a process comprising cleaning and phosphating metal surfaces, the improvement wherein the surfaces without previous activation are contacted in a temperature range of from 30° C. to 70° C. with an aqueous solution consisting essentially of:

(a) from about 10 to about 40 g/l of Ca^{2+} ions,

(b) from about 10 to about 40 g/l of Zn^{2+} ions,

(c) from about 10 to about 100 g/l of PO_4^{3-} ions,

(d) an accelerator selected from the group consisting of

(i) about 10 to about 100 g/l of nitrate ions and

(ii) about 0.1 to about 2.0 g/l of organic nitro compounds,

(e) up to about 10 g/l of Ni^{2+} ions, and

(f) up to abut 10 g/l of simple, complex, or mixed simple and complex fluoride ions,

said solution having a pH value in the range from about 2.0 to about 3.8, a ratio of free acid to total acid from about 1:4 to 1:100, and a ratio by weight of Zn^{+2} ions to Ca^{+2} ions of about 1:0.5 to about 1:1.5; said process producing on the metal surfaces a phosphate layer containing scholzite in an areal density between about 3 and about 9 g/m^2.

4,944,814

ALUMINUM-MANGANESE-IRON STEEL ALLOY

James M. Zimmer, Beaver, Pa., and William D. Bailey, Regina, Canada, assignors to Ipsco Enterprises, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 162,876, Mar. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 34,485, Apr. 2, 1987, abandoned. This application Aug. 31, 1989, Ser. No. 401,093

Int. Cl.[5] C22C *38/04, 38/06*

U.S. Cl. 148—329 **12 Claims**

1. A substantially austenitic steel alloy having a predetermined volume percent of ferrite structure in the range of about 1 percent to about 8 percent, said alloy comprising by weight 6 to 13 percent aluminum, 20 to 34 percent manganese, 0.2 to 1.4 percent carbon, 0.4 to 1.3 percent silicon, and the balance comprising iron, wherein the proportions of the elements alloyed with iron selected from the said ranges satisfy the formula

$$1 < VPF = 32 + 2.6(Al\ \% \pm 0.08) + 5.2(Si \pm 0.03) - 1.6(Mn\ \% + 0.16) - 8.5(C\ \% + 0.03) < 8$$

or substantial metallurgical equivalent thereof, where Al %, Si %, Mn % and C % are selected percentages by weight of aluminum, silicon, manganese and carbon respectively present in said alloy, and where VPF is the volume percent of ferrite structure; and wherein the proportions of the elements alloyed with iron are selected to exclude the following composition: (30±1)% Mn, (9±0.35)% Al, (1±0.05)% Si and (1±0.05)% C, with the balance being iron.

4,944,815

BONDING AGENT FOR COMPOSITE PROPELLANTS

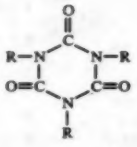
John P. Consaga, Waldorf, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 24, 1980, Ser. No. 178,258

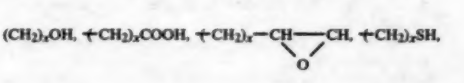
Int. Cl.[5] C06B *45/10*

U.S. Cl. 149—19.1 **25 Claims**

1. In a composite propellant, the improvement comprising the inclusion, in an effective amount, of a bonding agent represented by the formula:



wherein R is selected from the class consisting of



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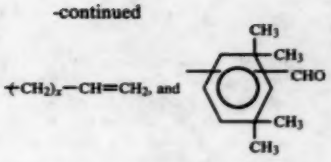


and x is from 1 to 5.

4,944,816

ULTRA-ULTRAHIGH BURNING RATE COMPOSITE MODIFIED DOUBLE-BASE PROPELLANTS CONTAINING POROUS AMMONIUM PERCHLORATE

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1976, Ser. No. 671,221

Int. Cl.[5] C06B *45/10*

U.S. Cl. 149—19.8 **2 Claims**

1. An ultra-ultrahigh burning rate composite modified double-base propellant composition consisting of an aluminum metal fuel in a combined weight percent from about 5 weight percent to about 11 weight percent, said aluminum metal fuel being present in an amount from about 1–3 weight percent of aluminum powder and in an amount from about 4–8 weight percent of aluminum staples; porous ammonium perchlorate in an amount from about 34–38 weight percent, said porous ammonium perchlorate coated with an N-arylalkeneimine to protect the porosity during propellant mixing; a nitrocellulose binder in an amount from about 16 to about 20 weight percent; nitroglycerin as an explosive plasticizer in an amount from about 28 to about 32 weight percent; triacetin as a non-explosive plasticizer in an amount from about 4 to about 8 weight percent; and an amount from about 1–3 weight percent of stabilizers selected from resorcinol and 2-nitrodiphenylamine.

4,944,817

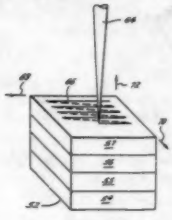
MULTIPLE MATERIAL SYSTEMS FOR SELECTIVE BEAM SINTERING

David L. Bourell; Harris L. Marcus; Joel W. Barlow; Joseph J. Beaman, and Carl R. Deckard, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 920,580, Oct. 17, 1986, Pat. No. 4,863,538. This application Sep. 5, 1989, Ser. No. 402,694

Int. Cl.[5] B27N *3/00*; B32B *31/00*; B23K *9/00*; B29C *67/00*

U.S. Cl. 156—62.2 **20 Claims**



7. A method of producing a part comprising the steps of:

depositing a first portion of powder onto a target surface, said first portion of powder comprising a plurality of materials, said plurality of materials having more than one bonding temperature;

scanning the aim of a directed energy beam over the target surface;

sintering a first layer of the first powder portion corresponding to a first cross-sectional region of the part by operating the beam when the aim of the beam is within boundaries defined by said first cross-sectional region;

depositing a second portion of powder onto the first sintered layer, said second portion of powder comprising a plurality of materials, said plurality of materials having more than one bonding temperature;

scanning the aim of a directed energy beam over the first sintered layer;

sintering a second layer of the second powder portion corresponding to a second cross-sectional region of the part by operating the beam when the aim of the beam is within boundaries defined by said second cross-sectional region, including the substep of

joining the first and second layers during the sintering of the second layer; and

depositing successive portions of powder onto the previous sintered layers and sintering each successive portion to produce successive sintered layers joined to a previous sintered layer and a part comprising a plurality of sintered layers.

4,944,818

COMPOSITE ROOFING SUBSTRATE PANEL

John M. Dybsky, 711 S. Dearborn, Chicago, Ill. 60605; George A. Erswell, Jr., 5015 Wickford Way, Dunwoody, Ga. 30338; John L. Silvestri, 4 Faith St., Lisbon Falls, Me. 04252; Karl H. Loser, 6925 60th Ave., New York, N.Y. 11378, and Craig A. McDonald, 6034 N. Nickerson, Chicago, Ill. 60631

Continuation-in-part of Ser. No. 32,325, Mar. 31, 1987, abandoned. This application Sep. 1, 1987, Ser. No. 93,098

Int. Cl.[5] B32B *5/26, 32/00*; E04D *5/10, 11/02*

U.S. Cl. 156—71 **20 Claims**

1. For use as a substrate for a torch-down roof membrane wherein the membrane and substrate are bonded together by the application of torch-generated heat applied to surfaces of the membrane and substrate, a composite panel comprising:

a board of lateral and longitudinal extent with upper and lower major surfaces, said board formed of a combustible material which is capable of igniting, charring or decomposing when exposed to torch-generated heat, and

a facer sheet overlyingly adhered to the upper surface of said board for providing the uppermost layer of said panel, said facer sheet being formed of a fabric of bituminous coated noncombustible fibers so that the uppermost layer of said panel resists ignition, charring or decomposition when exposed to torch-generated heat during the bonding of the torch-down roof membrane to said panel.

20. A method for applying a torch-down modified bitumen membrane roof to a roof deck comprising the steps of:

providing a laterally and longitudinally extending board of combustible fibers;

overlyingly adhering a noncombustible facer sheet to the upper major surface of said board, said facer sheet generally coextensive with said upper surface, thereby forming a panel;

covering said roof deck with a plurality of said panels and fastening said panels to said roof deck; and

covering said panels with a modified bitumen membrane while adhering said membrane to said panels by the application of flame.

4,944,819

USE OF 2-COMPONENT REACTION RESINS FOR FASTENING PURPOSES

Ludwig Gebauer, Olching, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Apr. 13, 1989, Ser. No. 337,734

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812814

Int. Cl.[5] B32B *31/14, 5/20*

U.S. Cl. 156—78 **4 Claims**

1. A method for fixing anchoring means, such as a tie bar, in a borehole comprising using mortar which is a foamable, free radical curable 2-component reactive resin composition to fix said anchoring means to said borehole, said composition containing about 35 to 85% by weight of reactive resin, about 0.1 to 5% by weight of peroxide curing agent and about 2.5 to 62% by weight of foaming agent, each % by weight being based on the total weight of the mortar composition.

4,944,820

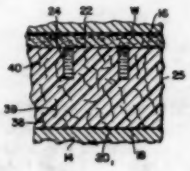
METHOD FOR MAKING A BLANKET FOR AN EXTENDED NIP PRESS

Paul McCarten, Scranton, Pa., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 8, 1988, Ser. No. 179,086

Int. Cl.[5] B32B *31/00, 31/22*; D21F *3/00*; B31C *13/00*

U.S. Cl. 156—154 **10 Claims**



1. A method of fabricating a blanket for an extended nip press which includes a shoe and a felt, said method including the sequential steps of:

simultaneously saturating a fiber mat on both sides thereof with polyurethane;

wrapping the saturated mat around a smooth mandrel;

heating the wrapped mandrel such that the polyurethane gels;

further heating the wrapped mandrel within a heating over for curing the polyurethane;

cooling the cured mat which constitutes the blanket;

grinding the blanket to a uniform thickness;

grooving the outer surface of the blanket while the blanket is still supported on the mandrel; and

removing the finished blanket from the mandrel.

4,944,821

ADHESIVE TREATMENT FOR NYLON CORDS

Tomohisa Nishikawa, Kodaira, and Kazuo Oshima, Higashiyamato, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,530

Claims priority, application Japan, Dec. 28, 1987, 62-330286; Dec. 28, 1987, 62-330287

Int. Cl.[5] B05D *1/18, 5/10*

U.S. Cl. 156—161 **8 Claims**

1. A method for treating nylon-6 cord with an adhesive containing the steps of:

(A) subjecting a twisted cord made from nylon-6 fiber having a yarn strength of not less than 12 g/d to a stretch heating treatment under temperature and tension conditions satisfying the following relationship:

$$T \geq 84/S - 80 \quad (1)$$

wherein T is a temperature (°C.) in the strength heating treatment of the cord and S is a tension (g/d) in the stretch heating treatment of the cord; and

(B) subjecting the resulting stretch heat treated cord to an adhesive treatment in a dipping solution satisfying the following relationships:

$$y \geq -0.75x + b \quad (2)$$

$$b = -0.274z^2 + 4.282z + 16.8 \quad (3)$$

wherein x is a solid content (weight %) in the dipping solution, y is a ratio (weight %) of the total weight of resorcin and formaldehyde to weight of latex in the dipping solution and z is a ratio (weight %) of the weight of vinylpyridine latex to the total weight of vinylpyridine latex and styrene-butadiene copolymer latex in the latex of the dipping solution.

4,944,822

METHOD FOR PRESS-BONDING LAMINATED ASSEMBLY

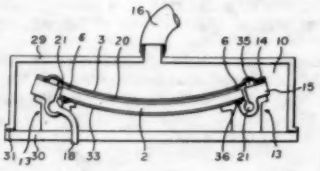
Kenichi Ishikawa; Koji Kurita; Satoru Fukawa, and Kenji Maeda, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,163

Claims priority, application Japan, Aug. 25, 1987, 62-209297; Sep. 8, 1987, 62-223171

Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—212 **10 Claims**



1. A method for press-bonding a laminated assembly of a sheet material and a plastic film, which comprises stacking a sheet material cut to have a predetermined shape and a plastic film, evacuating a first vacuum compartment formed by the plastic film, a circumferential frame for spreading the plastic film, the sheet material and a gasket to thereby evacuate the space between the plastic film and the sheet material and at the same time, evacuating a second vacuum compartment enclosing at least the plastic film side of the first vacuum compartment and separated from the first compartment, and then releasing the second vacuum compartment from the vacuumed condition so that the plastic film is press-bonded to the sheet material, wherein a primer layer capable of adhering at room temperature is applied, and said primer layer is provided at only the substantially peripheral portion of said sheet and wherein said first vacuum compartment is evacuated through at least one duct which forms a part of said circumferential frame.

4,944,823

COMPOSITION FOR BONDING SOLID LIGNOCELLULOSIC MATERIALS

John Stofko, Beaverton, Oreg., assignor to Carbocol, Inc., Beaverton, Oreg.

Filed Sep. 26, 1985, Ser. No. 780,295
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—283 15 Claims

1. A method of bonding wood surfaces together and thereby producing a consolidated wood product, which comprises

contacting said wood surfaces with an amount of bonding material of 1–15 grams per square foot area or 1–12% by weight based on the weight of wood, said bonding material consisting essentially of a homogeneous mixture, initially reacted in the substantial absence of water, of 50–95% by weight of starch or sugar or other active material, 5–50% of liquid isocyanate, 0–10% catalyst, 0–50% stabilizing agent and 0–10% release agent, or a glucourethane reaction product thereof, the total quantity of said liquid isocyanate being 0.25–2% by weight based on the weight of the wood;

pressing the coated wood surfaces together at an elevated temperature and for a time sufficient to effect bonding to produce said bonded wood product.

4,944,824

PROCESS FOR PREPARATION OF TOOLING OF CARBON FIBER REINFORCED POLYIMIDE FOR COMPOSITES MANUFACTURE

Dipak Gupta, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 23, 1988, Ser. No. 248,393
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] B32B 31/12
U.S. Cl. 156—286 1 Claim

1. A method for preparing a composite tool suitable for fabricating composite articles of high Tg comprising forming a lay-up of prepregs containing carbon fiber reinforcement and substantially stoichiometric quantities of a mixture of diamines consisting essentially of about 95% p-phenylene diamine with the remainder m-phenylene diamine and 2,3-bis-(3',4'-dicarboxyphenyl)hexafluoropropanol in an amount sufficient to produce 35 to 45 volume % of polyimide in the prepreg upon curing, enclosing the lay-up in a vacuum bag, heating the lay-up to a temperature in the range of about 250° to 400° F. while pulling a vacuum on the contents of the bag and while applying a pressure on the bag of at least 180 pounds per square inch, cooling the assembly while releasing the pressure and vacuum, and curing the assembly by heating in an oven to a temperature of at least 700°–725° F. at a rate of 1°–3° F. per minute until the Tg of the composite tool reaches at least 730° F. without application of external pressure but with application of vacuum to remove polymerization byproducts.

4,944,825

LABELING APPARATUS

Eric P. Gifford, Chagrin Falls, and William J. Roblin, North Royalton, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Oct. 28, 1988, Ser. No. 264,443
Int. Cl.[5] B32B 31/00
U.S. Cl. 156—294 15 Claims

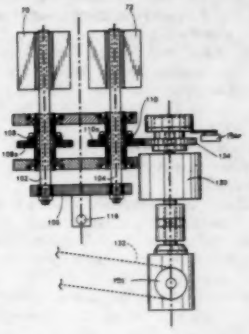
1. In a labeling apparatus having a labeling assembly for applying sleeve labels to products, a product advancing mechanism comprising:

(a) a pair of intermittently rotatable product advancing members for advancing a product from a product presenting position to a label applying position;

(b) said product advancing members including product engaging elements arranged such that when said product is in said label applying position, said product is located by confronting product engaging elements of said product advancing members;

(c) member support means defining a pair of laterally spaced and substantially parallel axes of rotation for said advancing members;

(d) means for reciprocally moving said advancing members along a path substantially parallel to said axes of rotation



of said advancing members to provide clearance for said labeling assembly as said labeling assembly moves through a label applying path of movement during a label applying cycle;

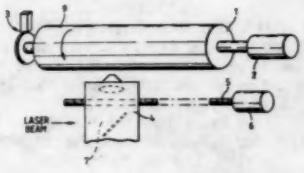
(e) means for synchronizing rotation and reciprocal movement of said product advancing members with said label applying assembly.

4,944,826

METHOD AND APPARATUS FOR PREPARING A SCREEN PRINTING SCREEN

Peter M. Zollman, Walton on Thames; Brendon T. Pollard, Betchworth, and Andrew D. Birch, Guildford, all of England, assignors to ZED Instruments Ltd., Surrey, England

Filed Aug. 17, 1988, Ser. No. 233,087
Claims priority, application United Kingdom, Aug. 17, 1987, 8719412
Int. Cl.[5] B41C 1/14
U.S. Cl. 156—345 9 Claims



1. In a laser engraving device for patterning a perforated screen printing screen having a lacquer coating filling its perforations by ablating said lacquer from said screen with a laser beam, said laser engraving device including a laser engraving head, and a scanner for scanning said laser engraving head over said screen printing screen, the improvement wherein said laser, engraving device includes a detector for detecting a locus of perforations in said screen printing screen extending in a scanning direction of said laser engraving head and a location of each of said perforations in said scanning direction and providing an output, alignment means operatively connected to said detector and said laser engraving head and responsive to said output of said detector to align said laser engraving head with said locus of said perforations detected by said

detector, and enabling means to enable said laser engraving device to be actuated only when said laser engraving head is aligned with an individual one of said perforations.

4,944,827

LABEL PRINTING SYSTEM FOR A COMPUTER OUTPUT LINE PRINTER

Norman R. Lilly, Stratford; M. James Marin, S. Norwalk, and Michael E. Field, Brookfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 150,474, Jan. 27, 1988, abandoned, which is a continuation of Ser. No. 883,228, Jul. 8, 1986, abandoned. This application Mar. 15, 1989, Ser. No. 323,238

Int. Cl.[5] B41J *15/00, 15/18*

U.S. Cl. 156—384 **10 Claims**

1. A label printer comprising:

(a) a computer output line printer said line printer further comprising:

(a1) a substantially cylindrical platten roller

(a2) a bail rod assembly means having a bail rod mounted parallel to the axis of, and resiliently bearing against, said platten roller for holding a web against said platten during printing;

(a3) a tractor feeder means, positioned on the path of said web through said printer downstream of said platten roller and said bail rod assembly, for drawing said web through said printer;

(a4) said platten roller, bail rod assembly means and tractor feeder means together defining a first web path for travel of a web of material through said label printer, said first path comprising a substantial straight portion between the point where said web passes between said bail rod assembly and said platten roller and said tractor feeder means; and,

(b) separator means for defining a separating edge spaced from and parallel to said bail rod, said separating edge, said platten roller, said bail rod and said tractor feeder means defining a second path for travel of a web of material through said label printer, said second path comprising a portion between the point where said web passes between said bail rod assembly and said platten roller and said tractor feeder means where said separating edge changes the direction of travel of said web by an angle, alpha, said angle, alpha, being sufficient, when said web is a web of release liner having labels mounted thereon, to separate said labels from said release liner as said release liner passes over said separating edge.

4,944,828

DEVICE AND METHOD FOR THE MANUFACTURE OF A TIRE REINFORCEMENT FROM A SINGLE CORD

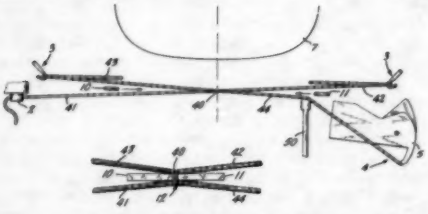
Jean-Claude Mayet, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin - Michelin et Cie, Clermont-Ferrand Cedex, France

Filed Feb. 8, 1989, Ser. No. 308,096

Claims priority, application France, Feb. 19, 1988, 88 02102

Int. Cl.[5] B29D *30/38, 30/20*

U.S. Cl. 156—397 **2 Claims**



1. A device for securing the ends of a tire reinforcement produced by hooking a continuous cord (4) back and forth between two circular arrays of retaining means (3) for the cord (4) so as to define a cylinder by a plurality of forward and return movements from one cord retaining means to the other cord retaining means, then folding the cords (4) on and around a core (7), characterized by the fact that said device comprises:

two jaws (10, 11) disposed on opposite sides of the strands (41+42, 43+44) of cord (4) to be cut which clamp the cord (4) by a movement parallel to a rotational axis of said core (7); a cutting system (12) for the cord (4) on the side of the jaws opposite the core (7); and means for bringing said jaws against said core while holding them closed.

4,944,829

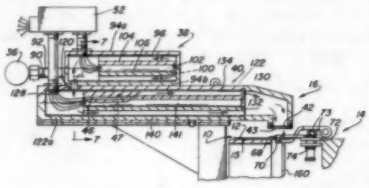
APPARATUS FOR APPLYING WRAPPERS

Kenneth A. Tuttle, Horsham, and James Corrado, Coopersburg, both of Pa., assignors to Rorer Pharmaceutical Corporation, Ft. Washington, Pa.

Filed Apr. 14, 1989, Ser. No. 338,117

Int. Cl.[5] B65C *9/25*

U.S. Cl. 156—497 **5 Claims**



1. Apparatus for securing a wrapper to each of a train of cylindrical objects with the wrapper extending at least partly around the circumference of each said object, said wrapper having a heat-activable adhesive layer on at least a portion of one side thereof, said apparatus comprising:

means for forming a moving train of said wrappers;

air-blast means supplied with said train of wrappers for applying a short blast of hot air against the surface of each successive wrapper of said train at a position opposite said portion of said one side to activate said heat-activatable adhesive layer on said portion by heat transmission through said wrapper;

means for forming a train of said objects; and

wrapping means supplied with said train of objects and with said train of wrappers from said air-blast means for wrapping each of said wrappers received from said air-blast means around one of said objects to adhere it thereto.

4,944,830

MACHINE FOR LABELLING BOTTLES

Rudolf Zodrow, Düsseldorf; Wolfgang Rogall, Wuppertal; Egon Höveler, Haan, and Rainer Buchholz, Düsseldorf, all of Fed. Rep. of Germany, assignors to Holstein und Kappert AG, Dortmund, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,653

Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717463; Mar. 3, 1988, 3806919

Int. Cl.[5] B65C *9/02*

U.S. Cl. 156—567 **18 Claims**

1. A labelling machine for a plurality of bottles comprising:

means for labelling said bottles;

a bottle support platform for supporting and advancing said bottles to said means for labelling;

said bottle support platform having a plurality of bottle turntables mounted thereon;

a plurality of support plates, a said support plate mounted on each of said bottle turntables to prevent relative rotation between each of said support plates and a respective said bottle turntable;

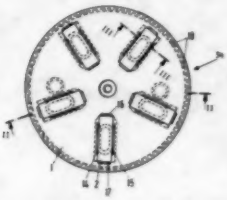
each of said support plate shaving an upper surface for receiving a bottom of one of said bottles thereon;

bottle feeding means for sequentially feeding said bottles onto said upper surfaces;

bottle removing means for sequentially removing said bottles from said upper surfaces;

said bottle support platform including means for selectively retaining a top of a said bottle when a said bottle has been positioned on a said upper surface by said bottle feeding means prior to advancement to said means for labelling;

said means for selectively retaining a said top being capable of producing an axial force between a bottom of a said bottle and a said upper surface;



each said support plate including an elastic body;

a plurality of block-shaped friction bodies being resiliently supported by each said elastic body with each of said friction bodies being embedded and held therein;

each of said friction bodies having an exposed, friction surface which lies generally in said upper surface of each said support plate; and

said axial force producing frictional contact between a bottom of a said bottle and a said plurality of said friction surfaces to prevent relative rotation between said bottles and said bottle turntables.

4,944,831

PROCESS FOR OBTAINING A PATTERN, IN FERROMAGNETIC MATERIAL HAVING DIFFERENTLY SLOPING SIDES

Henri Sibuet, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 5, 1988, Ser. No. 228,448

Claims priority, application France, Aug. 14, 1987, 87 11599

Int. Cl.[5] **B44C** *1/22;* **B29C** *37/00;* **C23F** *1/02;* **C03C** *15/00*

U.S. Cl. 156—643 **8 Claims**

1. Process for obtaining a pattern (4*a*) in a first material having differently sloping sides (20, 24), characterized in that it comprises the following stages:

(a) deposition on a layer of first material (4) of a first photosensitive resin (6) layer,

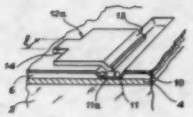
(b) formation of an opening (8) with inclined sides (8*a*) in the first resin layer (6),

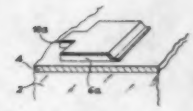
(c) producing a mask (10*a*, 12*a*) on the first resin layer (6), partly masking said opening (8), defining the shape or the pattern to be produced and having an inclined side (11*a*, 13) facing said opening,

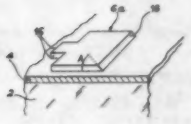
(d) anisotropic etching of the first resin layer (6) in order to eliminate the regions of said first layer which are not masked,

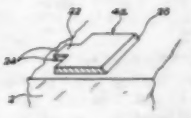
(e) elimination of the mask (12*a*),

(f) anisotropic etching of the layer of the first material (4*a*)









using the first etched resin layer as the etching mask (6*a*), and

(g) elimination of the remainder of the first resin layer (6).

4,944,832

LABEL PEELER

Ichiro Abe, and Toshio Suzuki, both of Tokyo, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,635

Claims priority, application Japan, Jan. 27, 1988, 63-8111[U]

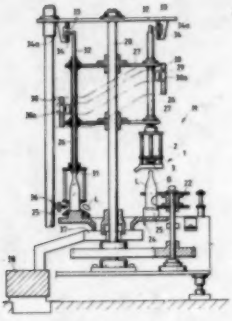
Int. Cl.[5] **B32B** *31/18*

U.S. Cl. 156—584 **5 Claims**

1. A device for peeling off a label attached to a side of a container, said device comprising:

a holder for holding the container; label scraping means of a substantially cylindrical structure made entirely of an elastomeric material for scraping the label off the container by effecting sliding movement in intimate contact with the side of the container; a label reattachment preventing means disposed adjacent to said label scraping

means for preventing the scraped label from being reattached to the container; and driving means for varying the



relative position of the container and said label scraping means to remove the label from the side of the container.

4,944,833

CZOCHRALSKI PULLING OF MONOCRYSTALLINE LANTHANUM ORTHOGALLATE

Roger F. Belt, Morristown, and Robert Uhrin, Brookside, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Mar. 4, 1988, Ser. No. 164,235
Int. Cl.[5] B01J *17/18*; C04B *35/46*
U.S. Cl. 156—617.1 **12 Claims**

1. A method of growing a monocrystalline lanthanum orthogallate from a pure melt along a predetermined crystallographic direction having dimensions greater than 1 cm in diameter and 10 cm in length which comprises:

a. forming a mixture of La_2O_3 and Ga_2O_3;

b. heating said mixture to form a melt of uniform composition in a controlled atmosphere; and,

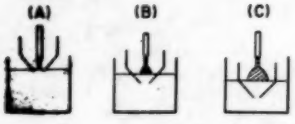
c. cooling said melt to form said monocrystalline lanthanum orthogallate.

4,944,834

PROCESS OF PULLING A CRYSTAL

Kohji Tada, and Toshihiro Kotani, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 900,008, Aug. 20, 1986, abandoned.
This application Jul. 7, 1988, Ser. No. 218,457
Claims priority, application Japan, Sep. 11, 1985, 60-199377
Int. Cl.[5] C30B *15/24*
U.S. Cl. 156—620.5 **6 Claims**



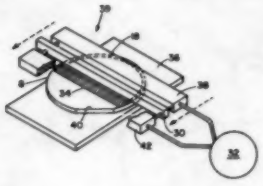
1. In a Czochralski process for pulling a crystal from a raw material melt comprising providing a baffle plate whose bore diameter is gradually increased upward and which is arranged in such a manner that the melt inside and outside the baffle plate is in communication with each other through a small opening part at the bottom end thereof, the improvement of which comprises moving the baffle plate relatively to the surface of the melt in such a manner that an annular space is maintained between the baffle plate and the crystal, and so as to increase the diameter of the melt surface inside the baffle plate with an increase of the diameter of the pulled crystal at the solid-liquid interface between the crystal and the melt surface.

4,944,835

SEEDING PROCESS IN ZONE RECRYSTALLIZATION

Lisa P. Allen, Norton; Duy-Phach Vu, Taunton; Michael W. Batty, No. Attleboro; Richard H. Morrision, Jr., Taunton, and Paul M. Zavracky, Norwood, all of Mass., assignors to Kopin Corporation, Taunton, Mass.

Filed Mar. 30, 1989, Ser. No. 330,458
Int. Cl.[5] C30B *13/32, 1/08, 19/08, 29/06*
U.S. Cl. 156—620.7 **13 Claims**



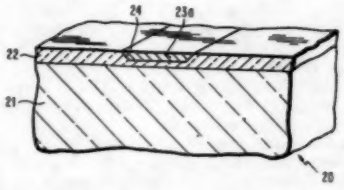
1. In a zone melting and recrystallization process in which a polysilicon film formed over an insulator film over a silicon wafer is melted, by translating a heater past the wafer, and allowed to recrystallize to form a substantially single crystal silicon film seeded by said silicon wafer through seed openings formed through the insulator to the silicon wafer, the improvement comprising forming said seed openings in a discontinuous pattern formed of discontinuous sub-patterns of shaped seed openings, said pattern extending in a semicircle closely adjacent the periphery of the wafer.

4,944,836

CHEM-MECH POLISHING METHOD FOR PRODUCING COPLANAR METAL/INSULATOR FILMS ON A SUBSTRATE

Klaus D. Beyer; William L. Guthrie, both of Poughkeepsie; Stanley R. Makarewicz, New Windsor; Eric Mendel, Poughkeepsie; William J. Patrick, Newburgh; Kathleen A. Perry, Lagrangeville; William A. Pliskin, Poughkeepsie; Jacob Riseman, Poughkeepsie; Paul M. Schaible, Poughkeepsie, and Charles L. Standley, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,860
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[5] H01L *21/304, 21/306*
U.S. Cl. 156—645 **11 Claims**



1. In the fabrication of planarized multilevel metal on a semiconductor substrate having active devices therein, the method for producing said multilevel metal comprising substantially coplanar conductive and insulator films on said substrate comprising the steps of:

forming a first layer of either said conductive film or said insulator film on said substrate,

said first layer having a non-planar upper surface,

depositing a second layer of the other of said conductive film or said insulator film on said first layer,

said second layer having an upper surface generally following the topography of the upper surface of said first layer, and

chem-mech polishing said structure in order to remove said second layer at a faster rate than said first layer until the upper surfaces of said first and second layers are substantially coplanar.

4,944,837

METHOD OF PROCESSING AN ARTICLE IN A SUPERCRITICAL ATMOSPHERE

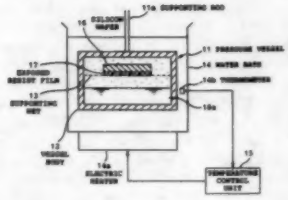
Masaru Nishikawa, Tsutsujigaoka Haimu A-409, 13-3, Shibazaki 2-chome, Chofu-shi, Tokyo, Japan; Kazumichi Nakagawa, and Yohichi Yamaguchi, both of Tokyo, Japan, assignors to Masaru Nishikawa and Hoya Corporation, both of Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,202

Claims priority, application Japan, Feb. 29, 1988, 63-47196

Int. Cl.[5] **B44C** *1/22;* **C23F** *1/02;* **B29C** *37/00;* **C03C** *15/00*

U.S. Cl. 156—646 **20 Claims**



1. A method of forming a patterned resist film having a predetermined pattern on a surface layer formed on a substrate, said method comprising the steps of depositing a resist film on said surface layer, pre-processing said resist film into a pre-processed resist film which is attached to said surface layer and which has a latent image of said predetermined pattern, and processing said pre-processed resist film into said patterned resist film, said processing step comprising the steps of:

introducing said pre-processed resist film together with said substrate into a supercritical atmosphere; and

developing said pre-processed resist film in said supercritical atmosphere to selectively remove said pre-processed resist film in accordance with said latent image and to thereby form said patterned resist film.

4,944,838

METHOD OF MAKING TAPERED SEMICONDUCTOR WAVEGUIDES

Thomas L. Koch, Holmdel, and Uziel Koren, Fair Haven, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 3, 1989, Ser. No. 389,074

Int. Cl.[5] **H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

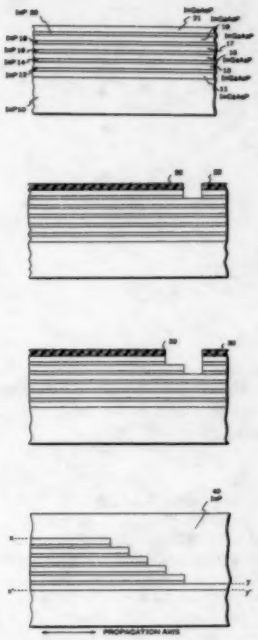
U.S. Cl. 156—652 **9 Claims**

1. A method for etching a multilayer semiconductor heterostructure body to form a waveguide device, said multilayer semiconductor heterostructure body including guiding layers and stop-etch layers interleaved with each other, the method comprising the steps of:

contacting a surface of a predetermined exposed guiding layer portion with a first material selective chemical etchant for a time period sufficient to expose a corresponding predetermined stop-etch layer portion;

contacting a surface of a predetermined exposed stop-etch layer portion with a second material selective chemical etchant for a time period sufficient to expose a corresponding predetermined guiding layer portion;

iterating in sequence the first contacting step followed by the second contacting step wherein the predetermined



exposed layer portions during a given iteration are longer than and include at least the predetermined exposed layer portions for previous iterations so that a staircase-like tapered waveguide profile is formed.

4,944,839

INTERSTAGE LIQUOR HEATER FOR PLATE TYPE FALLING FILM EVAPORATORS

Axel E. Rosenblad, Seabright, N.J., assignor to Rosenblad Corporation, Princeton, N.J.

Filed May 30, 1989, Ser. No. 357,808

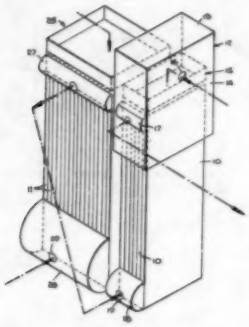
Int. Cl.[5] **B01D** *1/00*

U.S. Cl. 159—13.1 **5 Claims**

1. A falling film evaporator comprising a plurality of heating elements, said heating elements are envelopes comprised of flat plates joined at their peripheries; means for circulating a heating medium through the elements, in which some elements have their upper portions enclosed within a downwardly open hood; means for distributing liquor to be evaporated to surfaces of the heating elements, said hood serving to prevent direct contact heat exchange between feed liquor to be evaporated and condensible vapor generated by the evaporation of the liquor a vent exhaust port disposed within the hood; and means for feeding heating medium exiting from heating elements which do not have their upper portions enclosed within said hood to said elements which have their upper portions enclosed within said hood.

5. A falling film evaporator comprising a plurality of heating elements within a casing, said heating elements are envelopes comprised of flat plates joined at their peripheries; means for venting the heating elements, wherein some of the heating

elements have upper portions enclosed within a hood within the casing for collecting noncondensibles with the hood to prevent direct contact of liquor to be evaporated with condensible vapor within the hood; and means for circulating



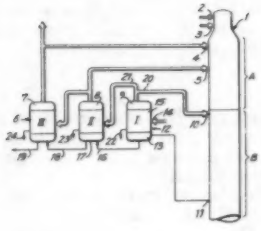
liquor collected at the bottom of the casing to a liquor distribution means positioned outside the hood for distributing liquor to heating elements which do not have their upper portions within the hood.

4,944,840

METHOD AND APPARATUS FOR EVAPORATING WASTE LIQUOR PRODUCED WHEN COOKING FIBROUS MATERIAL CONTAINING CELLULOSE

Kaj Henricson, Kotka, Finland; Ryham, Rolf, Princeton, N.J., and Sannholm, Krister, Espoo, Finland, assignors to Ahlströmföretagen Svenska AB, Norrköping, Sweden

Filed Jan. 11, 1989, Ser. No. 295,825
Claims priority, application Sweden, Jan. 14, 1988, 8800100
Int. Cl.[5] D21C *11/06*
U.S. Cl. 162—46 **13 Claims**



1. A method of evaporating waste liquor comprising:
(a) introducing fibrous cellulose containing material and cooking liquor into a continuous pulp digester having a cooking zone below an impregnation zone;
(b) heating said fibrous material to the cooking temperature by the addition of vapor to said cooking zone;
(c) discharging waste liquor from said digester;
(d) introducing said discharged waste liquor into a first of multiple evaporation stages;
(e) evaporating said waste liquor in said first evaporation stage by the addition of a heat medium;
(f) generating vapor in said evaporation stages;
(g) evaporating said waste liquor in a second evaporation stage by the addition of vapor generated in said first stage;
(h) evaporating said waste liquor in a third evaporation stage by the addition of vapor generated in said second stage;
(i) directly introducing into said cooking zone at least part of said vapor generated in said first evaporation stage for heating said fibrous material in step (b); and
(j) introducing into said impregnation zone at least part of said vapor generated in said second and third evaporation stages at different levels and at a temperature below said cooking temperature.

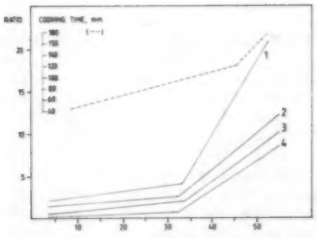
9. An apparatus for evaporating waste liquor containing fibrous cellulose material comprising:
a continuous digester for cooking said fibrous material at the cooking temperature, said digester comprising an impregnation zone and a cooking zone below said impregnation zone, an inlet opening for heating vapor in said cooking zone and a discharge opening for waste liquor;
a plurality of evaporation stages, the first evaporator stage comprising a vapor space, an evaporation chamber, a heat exchange element within said chamber, and a liquid space; means for maintaining the same pressure in said evaporation chamber as in said digester; said vapor space being in direct fluid communication with said heating vapor inlet opening in said cooking zone of said digester; said liquid space being in fluid communication with said waste liquor discharge opening of said digester; said heat exchange element of said first evaporation stage having an inlet for introducing vapor at a temperature higher than said cooking temperature; the second evaporation stage comprising a second evaporation chamber and a second vapor space, a vapor outlet, a second heat exchange element and a second liquid space within said second evaporation chamber; said second vapor space being connected to said first vapor space of said first evaporation stage and said second vapor outlet being connected to said impregnation zone; and
the third evaporation stage comprising a third evaporation chamber including a third vapor space, a third vapor outlet, a third heat exchange element and a third liquid space within said third evaporation chamber, said second vapor space being connected to said third heat exchange element, and said third vapor space being connected to said impregnation zone at a level above said connection of said second vapor outlet.

4,944,841

PROCEDURE FOR CONTROLLING ALKALINE PULPING PROCESSES

Eero Sjöström, and Alén Raimo, both of Helsinki, Finland, assignors to Kajaani Elektroniikka Oy, Finland

Filed Apr. 15, 1988, Ser. No. 181,825
The portion of the term of this patent subsequent to Aug. 1, 2006, has been disclaimed.
Int. Cl.[5] D21C *3/02, 7/12*
U.S. Cl. 162—49 **4 Claims**



1. A method of controlling an alkaline pulping process, comprising the steps of pulping cellulose material with an alkaline cooking liquor in a pulping process, said process being selected from the group consisting of a sulfate process, and a soda anthraquinone process, determining at a plurality of time intervals the concentration ratios of at least two different

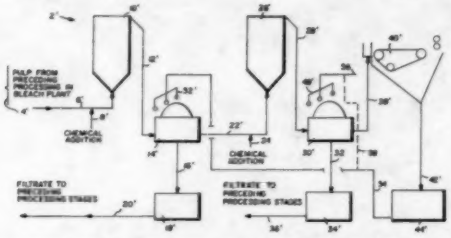
monomeric degradation compounds of lignin formed during the pulping wherein the ratios change at various times during the pulping, and terminating the pulping when a predetermined concentration ratio of said two compounds is reached.

4,944,842

METHOD FOR REDUCING CONTAMINATION IN PULP PROCESSING

C. Bertil Stromberg; Joseph R. Phillips, and Louis O. Torregrossa, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Glen Falls, N.Y.

Filed Mar. 26, 1987, Ser. No. 40,245
Int. Cl.[5] D21C *9/02, 9/10;* D21F *1/66*
U.S. Cl. 162—60 **20 Claims**


PULP FROM PRECEDING PROCESSING IN BLEACH PLANT
CHEMICAL ADDITION
FILTRATE TO PRECEDING PROCESSING STAGES
CHEMICAL ADDITION
FILTRATE TO PRECEDING PROCESSING STAGES

1. In a pulp processing system utilizing multiple pulp bleaching and washing stages prior to feeding of said pulp to a further processing device, the method comprising the steps of:

(a) feeding white water effluent from said further processing device directly to a next-to-last washing stage; and

(b) reducing contaimination of the pulp and white water effluent leaving the further processing device by feeding fresh water to the last washing stage, causing contamination in the white water effluent fed to the next-to-last washer stage to be reduced at the last washing stage.

16. In a pulp processing system including multiple bleaching and washing stages upstream of a further processing device, which further processing device discharges white water effluent, the improvement comprising:

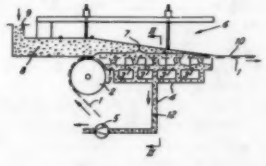
(a) means for reducing contamination of said pulp and said white water effluent, said means comprising first conduit means for feeding white water effluent from said further processing device to a next-to-last washing stage, and second conduit means for supplying fresh water to a last washing stage so that contamination of the pulp and white water effluent is reduced at the last washer stage.

4,944,843

PROCESS AND APPARATUS FOR FORMING PARTICULATE LAYERS

Peter L. Wallace, High Wycombe, and Anthony J. Willis, Marlow, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, United Kingdom

Filed May 25, 1988, Ser. No. 198,217
Claims priority, application United Kingdom, May 28, 1987, 8712522
Int. Cl.[5] D21F *1/00, 1/48, 1/66*
U.S. Cl. 162—101 **4 Claims**



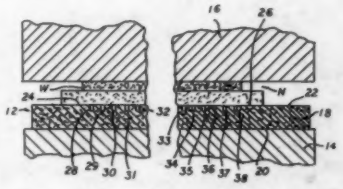
1. A process for forming a layer including fibrous material, comprising the steps of forming a foamed dispersion of fibrous material, moving a foraminous sheet through a predetermined zone of a plane, supplying said foamed dispersion to the predetermined zone of a plane through which a foraminous element is moving, controlling induction of free air into the predetermined zone by supplying the foamed dispersion through a confined channel defined in part by a head box having a slice coextensive with the predetermined zone on one side of said foraminous element, applying a vacuum to said plane across said zone on the other side of said foraminous element using a wet vacuum means, so as to drain foam therethrough and form a fibrous layer thereon, the drained foam having a level in the vacuum means, removing from said drained foam substantially immediately after drainage any free air drawn through or past the foraminous element during drainage to minimize foam destabilization by providing a vacuum line connected to the vacuum means at a position above the level of the foam therein, and continuously recycling the resulting foam for re-use in forming the foamed fibrous dispersion.

4,944,844

POLYURETHANE EXTENDED NIP PRESS BLANKET

Joseph J. Marcinko, Shaker Heights, Ohio, assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 11, 1989, Ser. No. 378,117
Int. Cl.[5] D21F *3/02*
U.S. Cl. 162—205 **7 Claims**



1. In an extended nip press defined by an elongate press shoe and a cooperating backing roll, a press blanket for pressing water from a formed web extending contiguously with the blanket through an extended nip defined between the elongate press shoe and the cooperating backing roll, the press shoe, the backing roll, and the blanket all having substantially the same cross machine direction width, said blanket comprising:

a single layer of fiber reinforced urethane defining an endless loop, said layer cooperating with the press shoe and extending through the extended nip for pressing the water from the formed web;

said single layer having an inner and an outer surface and a first and a second edge zone;

said inner surface of said single layer slidably cooperating with the press shoe, said inner surface being smooth and having a diameter which is reproducible to within a predetermined tolerance range;

said outer surface defining a plurality of parallel-spaced circumferential grooves for assisting the drainage of the water from the formed web during passage of the web between said outer surface and the backing roll; and

said edge zones each being devoid of said grooves for a width substantially greater than the distance between adjacent grooves such that during use of the blanket, fracturing of said single layer in the vicinity of said grooves disposed adjacent to said edge zones is inhibited.

7. A method of draining water from a formed web extending through an extended nip defined between an elongate press shoe and a backing roll, said method comprising the steps of:

moving a single layer fiber reinforced press blanket through the extended nip such that the web is disposed between the blanket and the backing roll; the press shoe, the back-

ing roll, and the blanket all having substantially the same cross machine direction width, and

draining water pressed from the formed web during passage of the web through the extended nip by means of a plurality of parallel-spaced circumferential grooves, the grooves extending over an outer surface of the blanket which faces toward the backing roll, the blanket having first and second lateral edge zones which each have a width substantially greater than the distance between adjacent grooves, the grooves terminating short of the first and second lateral edge zones of the blanket such that fracturing of the grooves in the vicinity of the edge zone is inhibited.

4,944,845

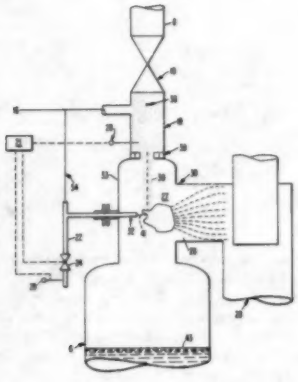
APPARATUS FOR UPGRADING LIQUID HYDROCARBONS

David B. Bartholic, 75 Wetumpka La., Watchung, N.J. 07060

Division of Ser. No. 116,886, Nov. 5, 1987, Pat. No. 4,859,315. This application Jul. 3, 1989, Ser. No. 365,118

Int. Cl.[5] B01J *8/18;* **C10G** *7/00, 9/28*

U.S. Cl. 202—84 **17 Claims**



1. Apparatus for the treatment of a liquid hydrocarbon charge containing solids or solids-forming contaminants comprising:

(a) a contactor vessel having at least one liquid charge inlet, at least one vaporizing media inlet above said charge inlet and at least one vapor-solids outlet;

(b) atomizing means positioned in said charge inlet for forming small particles of said liquid charge having a preselected size and directing said particles of liquid substantially horizontally into said contactor vessel;

(c) vaporizing media introduction means positioned in said vaporizing media inlet for introducing a fluidized mixture of a gas dispersion media and hot circulating solid particles into said contactor vessel substantially vertically so as to traverse the path of said liquid particles and intimately contact said liquid particles; and

(d) contactor separator means connected to said vapor-solids outlet for separating solid particles entrained in vapors formed in said contactor vessel;

(e) wherein said vapor-solids outlet is positioned in said contactor vessel substantially opposite said liquid charge inlet to receive said vapors and entrained solid particles and rapidly pass the same into said separator means.

4,944,846

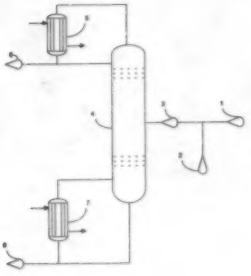
PROCESS FOR THE SEPARATION OF HF VIA AZEOTROPIC DISTILLATION

Leo E. Manzer; V. N. Mallikarjuna Rao, both of Wilmington, Del.; Richard T. Rockwell; Michael A. Sisk, both of Corpus Christi, Tex.; Edwin J. Warwas, Wilmington, and Roy Winteringham, Hockessin, both of Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1988, Ser. No. 226,737

Int. Cl.[5] B01D *3/00;* **C07C** *17/00*

U.S. Cl. 203—1 **6 Claims**



1. A process for the separation of hydrogen fluoride from an initial mixture which comprises hydrogen fluoride and either 2,2-dichloro-1,1,1-trifluoroethane or both 2,2-dichloro-1,1,1-trifluoroethane and 2-chloro-1,1,1,2-tetrafluoroethane, comprising the steps of:

(a) controlling the molar ratio of hydrogen fluoride to 2,2-dichloro-1,1,1-trifluoroethane in said initial mixture by adding 2,2-dichloro-1,1,1-trifluoroethane when the molar ratio of hydrogen fluoride to 2,2-dichloro-1,1,1-trifluoroethane is greater than about 1.3:1, thereby providing said initial mixture with a molar ratio of hydrogen fluoride to 2,2-dichloro-1,1,1-trifluoroethane of 1.3:1, or less;

(b) separating the initial mixture provided in step (a) by azeotropic distillation in a distillation column having a temperature of from about 50° C. to 300° C. and a pressure of from about 0.10 MPa to about 4.0 MPa at the bottom of the column;

(c) removing top products from the distillation column which contain a portion of the 2,2-dichloro-1,1,1-trifluoroethane from the initial mixture provided in step (a) and substantially all of the hydrogen fluoride from the initial mixture provided in step (a) and which comprise at least one low-boiling azeotrope selected from the group consisting of azeotropes of hydrogen fluoride and 2,2-dichloro-1,1,1-trifluoroethane, azeotropes of hydrogen fluoride and 2-chloro-1,1,1,2-tetrafluoroethane, and azeotropes of hydrogen fluoride and both 2,2-dichloro-1,1,1-trifluoroethane and 2-chloro-1,1,1,2-tetrafluoroethane; and

(d) removing bottom products from the distillation column which are substantially free of hydrogen fluoride and which comprise 2,2-dichloro-1,1,1-trifluoroethane; wherein sufficient 2,2-dichloro-1,1,1-trifluoroethane is withdrawn from the bottom of the distillation column to maintain said temperature and pressure.

4,944,847
METHOD FOR INHIBITING EPICHLOROHYDRIN FOULING

Karis W. Snow, Stafford, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 12, 1989, Ser. No. 364,736
Int. Cl.[5] B01D *3/34*
U.S. Cl. 203—8 3 Claims

1. A method of inhibiting fouling in distillation towers, overhead lines, reflux lines, and condensers operating in a process to manufacture and purify epichlorohydrin which method comprises treating process streams containing epichlorohydrin entering or exiting said towers, lines and condensers, including feed streams, reflux streams, gaseous or liquid overhead streams, with an effective antifouling amount of a C_3–C_9 linear or branched alkyl substituted catechol containing a major portion or percentage of 4-tertiary butyl catechol, or mixtures thereof, which linear or branched alkyl substituted catechols are dissolved in a liquid alcoholic solvent chosen from the group consisting of C_1–C_6 alcohols, C_1–C_6 chlorinated alcohols, and mixtures thereof.

4,944,848
PROCESS FOR THE PURIFICATION OF 1,1-DIPHENYLETHANE WITH GOOD FRAGRANCE QUALITY

Manfred Kaufhold, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 21, 1989, Ser. No. 410,408
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 3837450
Int. Cl.[5] B01D *3/00*
U.S. Cl. 203—35 13 Claims

1. A process for the purification of a 1,1-diphenylethane product with improved fragrance quality from a distillation residue of ethylbenzene production, comprising the steps of:

subjecting the distillation residue of ethylbenzene production to a first distillation to obtain a distillate comprising 1,1-diphenylethane;

washing said distillate with concentrated sulfuric acid at a temperature in the range of about −10° to +50° C.;

separating the sulfuric acid phase from an oil phase;

washing the oil phase with an aqueous solution of an alkali metal hydroxide followed by washing with water; and

subjecting the washed oil phase to a second distillation so that a 1,1-diphenylethane product comprising greater than 85% by wt. 1,1-diphenylethane having improved fragrance quality is obtained.

4,944,849
EXTRACTIVE DISTILLATION OF CYCLOALKANE/ALKANE FEED EMPLOYING SOLVENT MIXTURE

Fu Ming Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1989, Ser. No. 378,665
Int. Cl.[5] B01D *3/40*
U.S. Cl. 203—55 23 Claims

1. In a process for separating at least one cycloalkane containing 5–10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed consisting essentially of said at least one cycloalkane and said at least one alkane, the improvement which comprises employing a solvent consisting essentially of a mixture of

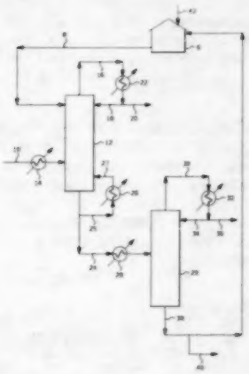
(a) at least one saturated alcohol selected from the group consisting of alkanols and cycloalkanols, wherein said alcohol contains 5–9 carbon atoms and one OH group per molecule, and

(b) cyclotetramethylene sulfone;

wherein said extractive distillation process produces (i) an overhead product which contains a smaller volume percentage of said at least one cycloalkane and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one cycloalkane and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one cycloalkane is separated from said solvent and recovered from said bottoms product.

13. In a process for separating at least one cycloalkane containing 5–10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed consisting essentially of said at least one cycloalkane and said at least one alkane, the improvement which comprises employing solvent consisting essentially of a mixture of

(a) at least one saturated alcohol selected from the group consisting of alkanols and cycloalkanols, wherein said



alcohol contains 5–9 carbon atoms and one OH group per molecule,

(b) cyclotetramethylene sulfone, and

(c) about 0.1–20 weight-% water;

wherein said extractive distillation process produces (i) an overhead product which contains a smaller volume percentage of said at least one cycloalkane and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one cycloalkane and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one cycloalkane is separated from said solvent and recovered from said bottoms product.

4,944,850
TAPE AUTOMATED BONDED (TAB) CIRCUIT AND METHOD FOR MAKING THE SAME

John H. Dion, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 18, 1989, Ser. No. 454,808
Int. Cl.[5] C25D *5/02*
U.S. Cl. 204—15 19 Claims

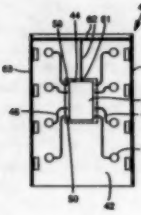
1. A method of manufacturing a tape automated bonded circuit comprising:

providing a flexible substrate having at least one conductive metal layer thereon and an opening therethrough;

selectively removing portions of said metal layer to form a pattern of conductive traces on said substrate, said pattern terminating in a plurality of leads which extend into said opening;

leaving a region of said metal layer intact over said opening, said region being smaller than said opening and conduc-

tively connected to all of said leads in order to short said leads together for the electro-plating thereof; and



electro-plating a metal coating onto said pattern of conductive traces, said region of said metal layer remaining in position over said opening during said electro-plating.

4,944,851

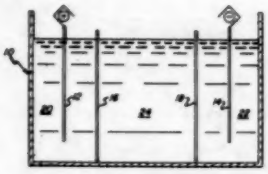
ELECTROLYTIC METHOD FOR REGENERATING TIN OR TIN-LEAD ALLOY STRIPPING COMPOSITIONS

John L. Cordani, Waterbury, and Raymond A. Letize, West Haven, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Jun. 5, 1989, Ser. No. 361,548

Int. Cl.[5] C25C *1/12, 1/14*; C23F *1/44, 1/46*

U.S. Cl. 204—106 **14 Claims**



1. A method for treating a metal stripping composition, initially comprised of an aqueous solution of an alkane sulfonic acid and ferric nitrate, and which by virtue of its use in stripping metals comprises of tin or tin-lead from a substrate surface, contains therein stripped metals comprised of tin and optionally lead in the form of solubilized metal salts, including soluble metal salts of said alkane sulfonic acid, comprising electrolyzing said aqueous solution utilizing an anode element and a cathode element under conditions of current density effective to deposit said stripped metals, in their metallic form, on the surfaces of said cathode element.

4,944,852

METHOD FOR PURIFYING A DIPEPTIDE ESTER

Yasuhiro Kurauchi; Michihiro Akazawa, both of Atsugi; Tsuneo Harada, Shin-nanyo; Kiyotaka Oyama, Hikari, and Akira Tokuda, Shin-nanyo, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,489

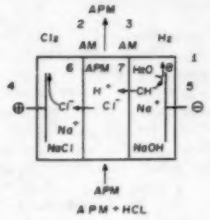
Claims priority, application Japan, Aug. 7, 1987, 62-196296

The portion of the term of this patent subsequent to May 15, 2006, has been disclaimed.

Int. Cl.[5] B01D *15/00*

U.S. Cl. 204—131 **10 Claims**

1. A method for purifying a dipeptide ester by electrolysis in an electrolytic cell comprising an anode compartment, a cathode compartment and a central compartment partitioned by anion exchange membranes, which comprises supplying an aqueous dipeptide ester solution containing an inorganic acid to the central compartment defined by said anion exchange membranes, an aqueous solution containing a basic substance or an aqueous electrolyte solution containing a basic substance to the cathode compartment and an aqueous electrolyte solution to the anode compartment, supplying hydroxyl ions from the cathode compartment to the central compartment through



the anion exchange membrane to neutralize the aqueous dipeptide ester solution containing the inorganic acid and removing anions of the inorganic acid in the aqueous dipeptide ester solution from the central compartment to the anode compartment through the anion exchange membrane.

4,944,853

PHOTOCHEMICAL PREPARATION OF 3-(ORGANOTHIO) ALDEHYDES

Stanley R. Sandler, Springfield, Del., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 11, 1989, Ser. No. 405,784

Int. Cl.[5] B01J *19/08*

U.S. Cl. 204—157.76 **10 Claims**

1. A process for the preparation of 3-(organothio) aldehydes comprising (a) forming an equimolar mixture of a C_1–C_{12} alkyl, a C_5–C_6 cycloalkyl or a C_6–C_{12} aryl or alkaryl mercaptan with a C_3–C_{10} α, β-unsaturated aliphatic aldehyde, and (b) subjecting said mixture to actinic radiation at a temperature ranging from about 2° to less than 60° C. in the absence of an oxygen-containing atmosphere to thereby produce a product consisting predominantly of the corresponding 3-(organothio) aldehyde.

4,944,854

ELECTRET PROCESS AND PRODUCTS

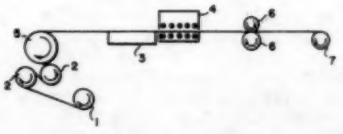
Clinton D. Felton, Charlotte; Baylor D. Gibson, Waxhaw; Charles E. Jamison, Charlotte; William O. McWhorter, Monroe, and George A. Serad, Charlotte, all of N.C., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 550,069, Nov. 8, 1983, Pat. No. 4,623,438.

This application Sep. 30, 1985, Ser. No. 781,164

Int. Cl.[5] C07C *3/24*

U.S. Cl. 204—168 **8 Claims**



1. A method for the manufacture of electrets which comprises passing a polymeric film or a warp beam of tightly packed synthetic yarn having a warp density as determined by light transmission of not more than 40% through a corona charging station a plurality of times while in a heated and tensioned condition, said corona charging station subjecting the film or yarn to corona discharge treatments generated between an upper grid member and a lower grid member.

4,944,855

AQUEOUS ELECTROCOATING BATHS FOR CATHODIC PLANT DEPOSITION AND PROCESSES FOR THEIR PREPARATION

Georg Schon, Everswinkel; Gunter Ott, and Michael Geist, both of Munster, all of Fed. Rep. of Germany, assignors to BASF Lacke + Farben Aktiengesellschaft, Munster, Fed. Rep. of Germany

PCT No. PCT/EP87/00130, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO87/05922, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 7, 1987, Ser. No. 275,085

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610183

Int. Cl.[5] C08L *63/00*; C25D *13/06*

U.S. Cl. 204—181.7 8 Claims

1. An aqueous electrocoating bath for cathodic paint deposition which contains, as a cathodically depositable binder, a modified epoxide-amine adduct and is prepared by reacting, in the presence of a basic amine catalyst,

(A) a polyepoxide with

(B) a compound which contains one or more hydroxyl groups per molecule bonded to an aromatic or (cyclo)aliphatic molecular fragment,

the reaction of (A) and (B) forming an epoxide group-containing intermediate, and by further reacting said intermediate with

(C) one or more amines or amine salts selected from the group consisting of primary (poly)amines, secondary (poly)amines, salts of said amines and salts of tertiary amines,

the resultant product being neutralized with acid, dispersed in an aqueous medium and processed to form an electrocoating bath, wherein said basic amine catalyst is neutralized prior to said further reaction of said intermediate, with a Brönsted acid having pK_s value of the first stage of dissociation, measured at 20° C., below 3.7.

4,944,856

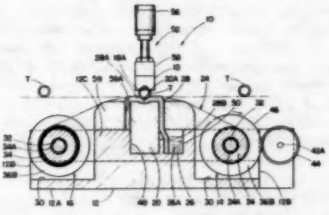
ELECTROLYTIC ETCHING APPARATUS AND METHOD FOR MARKING METAL TUBES WITH SEQUENTIAL IDENTIFICATION NUMBERS

John A. Catanese, Seward, and Susan R. Saunders, Cook Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 19, 1989, Ser. No. 340,199

Int. Cl.[5] C25F *3/02, 7/00*

U.S. Cl. 204—129.2 23 Claims



1. An electrolytic etching apparatus for marking a metal tube with identification indicia, comprising:

(a) a pair of spaced rotatable spools;

(b) a pair of upper and lower electrodes defining an etching station located between said spools, one of said electrodes being movable toward and away from the other;

(c) a continuous stencil connected to and extending between said spools such that rotation of said spools moves a portion of said stencil imprinted with identification indicia into said etching station between said upper and lower electrodes;

(d) a reservoir of electrolyte disposed below said stencil; and

(e) a wicking pad having a main portion disposed over and in contact with said lower electrode and below said portion of said stencil and an end portion extending downwardly into said reservoir of electrolyte, said wicking pad thereby capable of drawing up electrolyte from said reservoir by capillary action to provide a steady flow of the electrolyte to said wicking pad main portion for facilitating etching of the identification indicia on a metal tube placed below said upper electrode and above said lower electrode, wicking pad and stencil upon relative movement of said electrodes toward one another and application of a predetermined voltage to said electrodes.

4,944,857

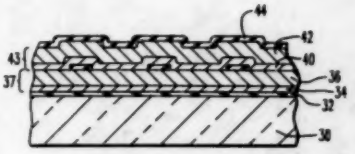
MONOLITHIC FREQUENCY SELECTIVE LIMITER FABRICATION

John D. Adam, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1989, Ser. No. 401,710

Int. Cl.[5] H01P *1/218*

U.S. Cl. 204—192.15 18 Claims



1. A method for assembling a frequency selective limiting unit having a multilayer structure, comprising the steps of:

depositing a first ferrite film on a metallized surface of a substrate layer;

growing a first ferrite layer on said first ferrite film;

positioning at least one signal carrying conductor on said first ferrite layer;

depositing a second ferrite film on said conductor and first ferrite layer in conformal manner;

growing a second ferrite layer on said second ferrite film to thereby form a monolithic multilayer structure; and

depositing a layer of metal on a free surface of said monolithic multilayer structure in contact with the metallized surface of the substrate layer forming a ground plane.

4,944,858

METHOD FOR APPLYING DIFFUSION ALUMINIDE COATING

Kenneth S. Murphy, Jupiter; Robert E. Hendricks, Port St. Lucie, both of Fla., and Richard J. Fenton, Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1988, Ser. No. 281,161

Int. Cl.[5] C23C *14/35*

U.S. Cl. 204—192.15 8 Claims

1. A process for forming an oxidation resistant diffusion

aluminide coating on a superalloy substrate, comprising the steps of simultaneously sputtering aluminum and an oxygen active element onto the substrate at conditions to diffuse aluminum and the oxygen active element into the substrate to form an outward diffusion aluminide coating microstructure characterized by an outer coating zone and and an inner coating zone, wherein the outer coating zone contains approximately 15–30 percent aluminum and 0.01–2.0 percent oxygen active element.

4,944,859

ELECTROLYTIC CELL FOR RECOVERY OF METAL

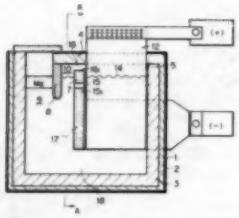
Hiroshi Matsuzami; Kunio Maehara, and Susumu Kosemura, all of Kanagawa, Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,143

Claims priority, application Japan, Mar. 30, 1988, 63-74597; Mar. 30, 1988, 63-74598; Jun. 8, 1988, 63-139440

Int. Cl.[5] C25C *3/04, 3/08, 3/22, 7/00*

U.S. Cl. 204—244 **10 Claims**



9. A bipolar type electrolytic cell for recovery of metal comprising a first partition wall provided with partition openings situated beneath the level of an electrobath and disposed between a disassociated metal recovery chamber and an electrolytic chamber having an anode and a cathode and a second partition wall adapted to constitute an intermediate chamber between said first and second partition walls for recovery of disassociated Cl_2 gas and wherein the insulation blocks situated beneath the anode and cathode or the bipolar electrodes are supported by shelves formed on the inner wall of the electrolytic chamber and control plates for preventing the stagnation of an electrobath flow are alternately disposed between the insulation blocks.

4,944,860

PLATEN ASSEMBLY FOR A VACUUM PROCESSING SYSTEM

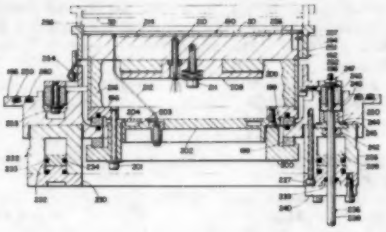
Robert B. Bramhall, Jr., Gloucester, and Richard M. Cloutier, Salisbury, both of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 4, 1988, Ser. No. 267,421

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.23 **10 Claims**

1. Apparatus for holding a semiconductor wafer for treatment in a vacuum environment comprising a circular plate having a wafer receiving surface formed thereon for receiving a wafer in a substantially horizontal position, a ring disposed in surrounding relation to said plate, first wafer engaging means formed on said ring for supporting a wafer in alignment with said wafer receiving surface, second wafer engaging means formed on said ring above said first wafer engaging means for exerting a clamping force against a wafer to maintain said wafer in engagement with said wafer receiving surface, and means for moving said ring between a first position wherein a wafer is supported by said first wafer engaging means in spaced relation to said wafer receiving surface and a second position



wherein said wafer is supported by said wafer receiving surface and engaged by said second wafer engaging means.

4,944,861

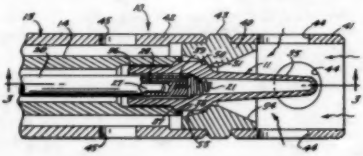
OXYGEN SENSING PROBE HAVING IMPROVED SENSOR TIP AND TIP-SUPPORTING TUBE

Eric J. Reber, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 3, 1989, Ser. No. 332,052

Int. Cl.[5] G01N *27/417*

U.S. Cl. 204—428 **12 Claims**



1. A probe for measuring the concentration of oxygen in fluids, said probe comprising an outer tube defining an outer conductor, an inner tube coaxial with and spaced inwardly from said outer tube, a sensor tip secured to said inner tube and composed of solid electrolyte material, two electrodes disposed on opposite sides of said sensor tip, and an inner conductor in electrical contact with one of said electrodes, said probe being characterized in that an electrically conductive sleeve is telescoped tightly into one end portion of said outer tube in electrical contact therewith and is telescoped over said sensor tip in electrical contact with the other of said electrodes, one end portion of said sleeve being formed with an annular frustoconical seat, said tip being formed with a frustoconical shoulder located in faceto-face mating engagement with the seat of said sleeve, the seat of said sleeve being defined by a series of angularly spaced segments having passages therebetween to permit fluid to flow out of the inside of said sleeve and along the outside of said inner tube.

4,944,862

INTEGRATED CATALYTIC DEWAXING AND CATALYTIC CRACKING PROCESS

Nai Y. Chen, Titusville; Anil B. Ketkar, Cranbury, and Randall D. Partridge, West Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 26, 1988, Ser. No. 262,779

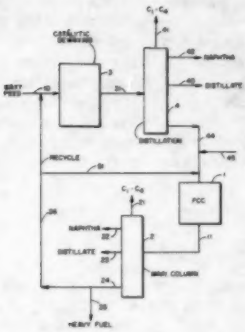
Int. Cl.[5] C10G *69/04, 55/06*

U.S. Cl. 208—49 **22 Claims**

1. An integrated process for upgrading a heavy hydrocarbon feed comprising waxy components, and having an end boiling point exceeding 750 F. into lighter products including a heavy

fuel oil product by subjecting said feed to both dewaxing and catalytic cracking by:

(a) catalytically dewaxing at least a portion of said feed to produce a dewaxed product with a reduced wax content, and an end boiling point exceeding 750 F. and



(b) catalytically upgrading said dewaxed product by catalytic treatment consisting essentially of catalytic cracking with a conventional catalytic cracking catalyst in a conventional catalytic cracking unit to produce a catalytically cracked product comprising a heavy fuel oil product.

4,944,863

THERMAL HYDROCRACKING OF HEAVY STOCKS IN THE PRESENCE OF SOLVENTS

C. Morris Smith, Princeton, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corp., New York, N.Y.

Filed Sep. 19, 1989, Ser. No. 409,374

Int. Cl.[5] C10G *47/00*

U.S. Cl. 208—107 **23 Claims**

1. A process for treating heavy petroleum stocks comprising thermally hydrocracking a heavy stock in the presence of gaseous hydrogen and a substantially inert solvent.

4,944,864

PROCESS USING CRACKING CALALYST CONTAINING STRONTIUM CARBONATE

Edwin L. Kugler, Glen Gardner, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 14,469, Feb. 13, 1987, Pat. No. 4,824,815, which is a continuation-in-part of Ser. No. 743,593, Jun. 11, 1985, abandoned. This application Mar. 27, 1989, Ser. No. 328,845

Int. Cl.[5] C10G *11/05*

U.S. Cl. 208—120 **8 Claims**

1. A process for converting a hydrocarbon oil containing at least one vanadium-containing compound, nickel-containing compound, or mixture thereof to lower boiling hydrocarbon products which comprises contacting the oil at conversion conditions with a cracking catalyst containing

(a) a zeolitic material;

(b) a matrix material; and

(c) strontium carbonate dispersed in the matrix as discrete particles, wherein strontium carbonate is present in an amount sufficient to form a product having a melting point greater than about 670° C. when the carbonate is reacted with the vanadium-containing compound, nickel-containing compound, or mixture thereof, at fluid catalytic cracking regenerator temperatures.

4,944,865

PROCESS FOR CRACKING HIGH METALS CONTENT FEEDSTOCKS

Mario L. Occelli, Allison Park, and James V. Kennedy, Pittsburgh, both of Pa., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 640,388, Aug. 13, 1984, abandoned, and a continuation-in-part of Ser. No. 375,379, May 6, 1982, Pat. No. 4,465,588. This application Sep. 19, 1986, Ser. No. 909,819

Int. Cl.[5] C10G *11/18*

U.S. Cl. 208—121 **6 Claims**

1. In a process which comprises the cracking, in the absence of added hydrogen, of a vanadium-containing hydrogen feed in a cracking zone under cracking conditions employing a cracking catalyst having high activity; the improvement which comprises combining with said catalyst a diluent consisting essentially of magnesium oxide to form a catalyst composite, said diluent forming a separate and distinct entity within said catalyst composite, and the concentration of said diluent within said composite being adjusted so as to be directly proportional to the concentration of vanadium on said catalyst composite in said cracking zone and wherein said concentration of said diluent is in the range of 20–50 weight percent of said catalyst composite.

4,944,866

PROCESS FOR THE HYDROGENATION OF COAL

Klaus Fuhrmann, Everskamp; Ulrich Graeser, Haltern, and Ludwig Merz, Recklinghausen, all of Fed. Rep. of Germany, assignors to Veba Oel Technologie GmbH, Gelsenkirchen, Fed. Rep. of Germany

Continuation of Ser. No. 595,036, Mar. 29, 1984, abandoned. This application Apr. 15, 1986, Ser. No. 852,391

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3311552

Int. Cl.[5] C10G *1/06*

U.S. Cl. 208—408 **6 Claims**

1. A process for the hydrogenation of coal, which comprises:

slurrying pulverized coal with an oil, wherein the coal and oil are slurried in a weight ratio of coal:oil of from about 1:20 to 1:1, said oil consisting of a non-process derived hydrocarbon mixture having a boiling range above about 200° C., in an amount of 40–100% by weight and selected from the group consisting of mineral oils containing substantial amounts of aromatic and naphthenic compounds, mineral oil derived top residue, vacuum residue, heavy oils, oils obtained from the retorting of oil shales or tar sands, and mixtures thereof, and the remainder of said oil being process-derived oils having a boiling range above about 200° C., and obtained by fractionated condensation of the gaseous product leaving a hot separation step following,

hydrogenating the mixture of coal and oil at an elevated temperature of about 350°–520° C. and under hydrogen pressure of about 100–1,000 bar, in a liquid-phase hydrogenation step to yield a product mixture,

using at least one hot separation step to separate said product mixture into a gaseous non-condensed fraction and into liquid and solid products and wherein oil obtained by fractionated condensation of the gaseous product or an oil obtained by the solid enrichment of the separated liquid and solid products as used, at least partially, as the process derived portion of the slurry oil; and further

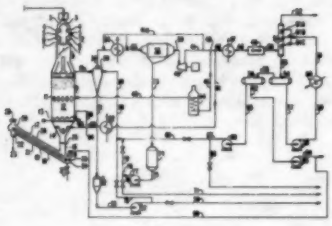
hydrogenating the remainder of said gaseous product, without depressurizing the gas phase over fixed bed catalysts.

4,944,867

PROCESS TO SECURE OIL, GAS, AND BY-PRODUCTS FROM PYROBETUMINOUS SHALE AND OTHER MATTER IMPREGNATED WITH HYDROCARBONS

Rene Mundstock; Kuniyuki Terabe; Antonio R. de Almeida Lamprecht; Joao C. Teixeira, all of Sao Mateus do Sul; Altair R. D. Batista, Rio de Janeiro; Edson d. Dias, Sao José dos Campos; Luiz D. Santos, Macaé ; Osvaldo Amorim, Campinas; Joel Rezende, Curitiba; Jorge H. Filho, Sao Mateus do Sul; Joao C. Gobbo, Curitiba, and Romeu Machado, Curitiba, all of Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Filed Dec. 22, 1987, Ser. No. 136,573
Claims priority, application Brazil, Dec. 22, 1986, 8606369
Int. Cl.[5] C10G *1/00*
U.S. Cl. 208—409 3 Claims



1. In a process for obtaining oil, gas and other products from pyrobituminous shales and other matter impregnated with hydrocarbons, which includes introducing crushed shale from a hopper downwardly into the upper portion of a retort through rotating charging devices having gas operated sealing means, contacting said crushed shale in the top portion of the retort with a stream of retort gasses, injecting hot gasses at an intermediate point of said retort at a temperature of about 500° C. to about 600° C., introducing a stream of cold gasses at the bottom of said retort at a temperature ranging between 110° C. and 180° C. and at a pressure of 15 kPa to 50 kPa (pressure gauge), discharging the crushed shale through a bottom sealing mechanism, removing gaseous retorted matter above the zone where the shale undergoes pyrolysis treatment, directing said gaseous retorted matter to a cyclone **29** for separation of heavy liquid components from a gaseous stream containing very fine solids in a mist, precipitating the very fine solids, compressing said gaseous stream, directing a first portion of said compressed gaseous stream through a heater **44** to raise the temperature to about 500°–600° C. for injection into said retort to start pyrolysis of the shale, directing a second portion of said compressed gaseous stream through a heat regenerator to reduce the temperature to about 110°–130° C. and injecting said stream into the retort through nozzles **15**, directing a third portion of said compressed gaseous stream through cooling means to a spray tower **51** for separation of a gaseous component for extraction and a liquid component consisting primarily of water and heavy oil, and directing the liquid component to a decanting system, the improvement comprising:

(a) supplying the liquid component comprised of water and heavy oil to first and second separating decanters **54** and **56** connected in series, removing the bottom watery layer from said first decanter to a circulating pump **58**, pumping the bottom watery layer into said spray tower as a spray for condensation of said liquid components of the gasses, transferring the top layer containing mainly oil by pipe **55** to said second decanter **56**, removing the bottom watery part to a pump **63** for disposal while supplying the oily portion to a pump **66** from which part of the oily portion separated for reuse outside the process and recirculating the remainder of the oily portion to said cyclone **29**,

(b) cooling gasses issuing from said cyclone **29** in a heat regenerator **34** to lower their thermal charge and passing the cooled gasses through electrostatic precipitators **36** to a compressor so as to cause the temperature of the gasses to drop by about 20° to 60° C. in order to enter the compressor at a temperature of about 130°–180° C. and preferably about 130°–140° C.,

(c) directing a portion of said compressed gaseous stream from the compressor through a heat regenerator **47** and an air operated cooler **49** in sequence so that the temperature may be brought down to about 90° C. and supplying the cool compressed gas to the spray tower **51**,

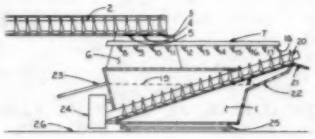
(d) injecting a portion of said compressed gaseous stream from the compressor as a "cold gas" into the bottom of the retort whereby the difference in pressure between the charging devices and sealing means of the retort and the bottom portion of the retort is about 1.36 kPa.

4,944,868

PROCESS AND APPARATUS FOR SEPARATING PLASTICS FROM CONTAMINANTS

Jerry L. Jay, Sr., Rte. 3 #3, Box 239, and Ben Cottrell, Rte. 3 #3, Box 313, both of Newbern, Tenn. 38059

Filed Aug. 28, 1988, Ser. No. 227,604
Int. Cl.[5] B03B *5/28*
U.S. Cl. 209—10 6 Claims



1. A process for separating plastics from contaminants comprising the steps of: providing a supply auger for delivering contaminated plastic particles to a separation tank; the separation tank being equipped with a separation discharge auger that will discharge materials that sink and a discharge chute that will discharge particles that float, and is filled with a separation solution; rotating the wash tank to deposit either sink or float material into a wash tank; the wash tank being filled with a wash solution for cleaning any dirt or residue remaining on the particles after separation; the wash tank being supplied with a wash tank discharge auger to carry the particles through and out of the wash tank to a rinse tank; providing front, rear, and center support legs for the wash tank; adjusting the level of the wash solution in relation with the wash tank discharge auger by adjusting the front and rear legs in relation to the center leg so that the wash solution level will be altered, in relation to the auger, so that the auger is more or less submerged in the solution, to make it most efficient in transferring either sink or float materials through and out of the wash tank to the rinse tank; the rinse tank being filled with a rinse solution for rinsing away any residue remaining on the particles from the wash tank; the rinse tank being supplied with a rinse tank discharge auger to carry the particles through and out of the rinse tank to a lift conveyor; providing front, rear, and center support legs for the rinse tank; adjusting the level of the rinse solution in relation to the rinse tank discharge auger by adjusting the front and rear legs in relation to the center leg so that the solution level is altered, in relation to the auger, so that the auger is more or less submerged in the solution to make it most efficient in transferring sink or float materials to the lift conveyor; the lift conveyor transferring the material to a material dryer where it is dried and discharged ready for reuse or remanufacturing.

4,944,869

METHOD AND INSTALLATION FOR OBTAINING ENRICHED FRACTIONS FROM USED STORAGE BATTERIES

Nedyalko K. Lyakov; Georgi A. Haralampiev; Todor G. Nikolov, all of Sofia; Georgi S. Buyukliev, Kardjali; Peter S. Petrov, Kardjali; Peter V. Valchev, Kardjali; Valcho P. Myuftiev, Kardjali, and Kalin T. Primov, Kardjali, all of Bulgaria, assignors to Nauchno-Installation Sektor-Vchti, Sofia, Bulgaria

Filed Aug. 16, 1988, Ser. No. 232,828
Int. Cl.[5] B03B 5/56
U.S. Cl. 209—173 6 Claims

1. An apparatus for obtaining enriched fractions from used storage batteries having a plurality of units arranged in series, each unit comprising

two concentrically disposed drums, namely an outer cylindrical drum and an inner cylindrical perforated drum;

said cylinder having a first helical strip mounted on its inner wall, a lid with inlet opening fastened to a front part of said cylinder, a first cone fixed at a rear part of said cylinder, said first cone having a second helical strip mounted on its inner wall;

the first cone ending in an annular opening with a second inverse cone;

a perforated partition with an intermediate opening is disposed between said cylinder and said first cone;

the cylinder being provided with reinforcing rings on its outer wall;

in the front end of the inner wall at the lid a plurality of stirring blades are mounted, while the inner perforated drum is mounted, fixed by means of ribs;

said inner perforated drum having a third helical strip mounted on an inner wall thereof;

perforated blades being fastened to the outer wall of said inner perforated drum;

longitudinal openings being formed at the base of said blades within the cylinder;

the front end of the inner perforated drum being closed by a bottom; reflectors being mounted over the longitudinal openings; and a screen being fixed over the intermediate opening;

a small perforated cylinder, which is closed by a jacket having an opening, being fastened to the inverse cone; and an inclined worm being mounted to a lower part of said small perforated cylinder, in a plane perpendicular to an axial line of the small perforated cylinder;

the inner perforated drum ending in a conic perforated passage to which is fastened a tube with a fourth helical strip and an outlet opening;

while concentrically to the tube, which is perforated in a zone after the small perforated cylinder, there being fastened a large perforated cylinder which is closed by a jacket with a first opening and a second opening, while over the small and large perforated cylinders are disposed nozzles.

4,944,870

AUTOMATIC FILTRATION DEWATERING SYSTEM

Aisaburo Yagishita, Nagoya; Yasunori Iriyama, Iwakura, and Jouichiro Osuga, Nagoya, all of Japan, assignors to Kabushiki Kaisha Yagishita, Tokyo, Japan

Continuation of Ser. No. 844,198, Mar. 26, 1986, abandoned.
This application Feb. 21, 1989, Ser. No. 313,342
Claims priority, application Japan, Mar. 27, 1985, 60-060773
Int. Cl.[5] B01D 33/044, 33/82, 33/70
U.S. Cl. 210—103 1 Claim

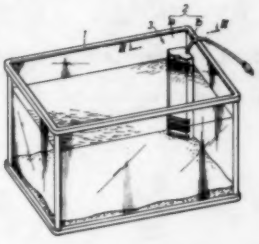
1. An automatic filtration dewatering system, comprising a cover to which a supply pipe is connected, a plate having a filter medium support engaged with an upper surface thereof and a filtrate exhaust pipe, a pneumatic cylinder for vertically moving said cover into and out of contact with said plate, a plurality of filter medium moving rollers provided on both sides of said cover and said plate, and a sheet-like long filter medium stretched over said rollers and means for moving the filter medium a predetermined distance per one step of filtration, said filter medium being temporarily fixedly held between a circumferential portion of said cover and a circumferential portion of said plate; and further including a control system having valve means for operating said pneumatic cylinder just after receiving a starting signal to close said cover and said plate and for generating a closed condition signal when the cover and plate are closed, pump means for supplying raw liquid for filtration via said supply pipe after such closed condition signal is detected and a predetermined closed time has elapsed, means for stopping supply of said raw liquid at the earlier time either when pressure of said raw liquid in said cover has reached a predetermined value or a predetermined filtration time has elapsed, means for supplying pressurized air through the supply pipe to the filter medium for at least a predetermined time interval and until air pressure in said cover becomes lower than a predetermined value to reduce the mother liquor content of the filter cake, pressure switch means connected to the supply pipe for detecting said predetermined values of raw liquid pressure and air pressure in said supply pipe, means for operating said pneumatic cylinder to separate said cover from said plate, and switch means for detecting a separate position of said cover by means of a limit switch to generate a signal for starting movement of said filter medium, wherein said control system further includes delay timer means for inducing said predetermined closed time to enable pressure acting to close said cover to reach a closed pressure before a supply of raw liquid is supplied into the cover for filtration.

4,944,871

FILTERING DEVICE

Yonekichi Ogawa, Tokyo, Japan, assignor to Suisaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 205,780
Claims priority, application Japan, Jun. 11, 1987, 62-145889
Int. Cl.[5] B01D 29/56
U.S. Cl. 210—169 8 Claims



1. A filtering device comprising a vertically extending housing attached to a wall surface of a water basin, the housing having a filtering chamber therein, a water intake port and a water discharge port, these intake and discharge ports communicating with the filtering chamber, a vertically extending filtering material being accommodated in an interior of said housing so as to divide said filtering chamber into an unpurified chamber and a purified chamber on opposite sides of the material, a vertically extending suction pipe mounted in said housing and communicating with a lower end of the purified chamber as well as with said water discharge port, said water intake port communicating with the unpurified chamber, and a pump unit including a motor being mounted in the housing so as to circulate water in said suction pipe from an upper end of the suction pipe into the water basin through the water discharge port, said housing further having an auxiliary filtering chamber therein surrounding a sufficient portion of said pump unit to cool said motor with water flowing through said auxiliary

filtering chamber during operation of said device, said auxiliary filtering chamber communicating with an auxiliary water intake port perforated in the housing and with the unpurified chamber to admit water flow from the auxiliary water intake port to the unpurified chamber through the auxiliary filtering chamber.

4,944,872

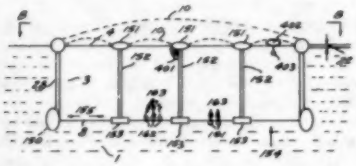
APPARATUS AND METHOD FOR CONTAINING AND PROCESSING LIQUIDS AND WASTES

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Continuation of Ser. No. 423,782, Sep. 27, 1982, abandoned. This application May 10, 1985, Ser. No. 732,803

Int. Cl.[5] B63B *38/00*

U.S. Cl. 210—170 **4 Claims**



1. A flexible enclosure for containing liquid and solid materials, the enclosure being constructed and connected in support reception to support means arranged to be disposed within a body of water, comprising:

(a) an enclosed side wall defining a lateral boundary for the enclosure and having a lower edge;

(b) at least one float means for supporting said side wall in said body of water;

(c) a flexible membrane attached to said lower edge of said side wall and closing off the enclosure to form a bottom thereof; and

(d) means for restoring said membrane bottom to a substantially level condition in the event of a surface deformity.

4,944,873

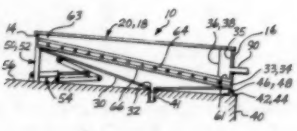
DEWATERING SYSTEM FOR SLUDGE REMOVAL

Jack R. Williams, Box 207, Westport, Wash. 98595

Filed Jan. 12, 1989, Ser. No. 296,447

Int. Cl.[5] B01D *24/14*

U.S. Cl. 210—209 **4 Claims**



1. A dewatering system for use in the treatment of waste water comprising:

a tank adapted to receive waste water;

a filter bed disposed within the tank and adjustably inclined with respect to the horizontal for removing solids from the waste water as it is drawn downward through the bed by gravity, the bed including filter media which remain stationary with respect to the bed;

means for discharging waste water into the tank above the filter bed;

means for inducing a flow of air through the filter bed to facilitate drying of the removed solids; and

means for adjusting the angle of inclination of the filter bed including a scissors linkage pivotally mounted to the filter bed and power means for actuating the linkage.

4,944,874

CENTRIFUGAL SEPARATOR

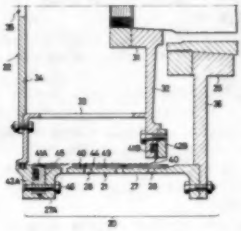
Masaru Kobayashi, Shizuoka, and Sumio Kawai, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Okawara Seisakusho, Japan

Filed Oct. 25, 1988, Ser. No. 262,835

Claims priority, application Japan, Dec. 12, 1986, 61-296406; Dec. 9, 1987, 62-311775

Int. Cl.[5] B01D *33/10*

U.S. Cl. 210—232 **17 Claims**



1. A centrifugal separator comprising:

(a) a rotatable centrifugal drum rotatable about an axis of rotation and including a perforated basket having an open end, and a rotor slidably received in said basket and normally closing said open end of said basket, said rotor being rotatable in unison with said basket and reciprocally movable in a direction parallel to the axis of rotation of said drum into and out of said drum through said open end of said basket;

(b) a flexible annular filter extending between said basket and said rotor to be overturned in response to the reciprocating movement of said rotor;

(c) a water-permeable tubular screen disposed between said filter and an inner peripheral surface of said basket and having an annular flange at one end thereof detachably connected to said open end of said basket, said annular flange of said screen having a first circular groove receiving therein one peripheral edge of said annular filter, said rotor including an annular end plate having a second circular groove facing away from said first circular groove in a direction away from the open end of said basket and receiving therein the other peripheral edge of said annular filter, and a pair of presser ring plates detachably connected to said annular flange and said end plate, respectively, for holding said peripheral edges of said filter in said first and second circular grooves; and

(d) spacer means disposed between said screen and said basket for holding them in radially spaced relation to one another.

4,944,875

PLURAL FILTER TUBE SEQUENTIAL DISTRIBUTION APPARATUS

Yves Gaignet, Montigny Le Bretonneux, France, assignor to Millipore, S.A., St. Quentin en Yvelines Cedex, France

Filed Jun. 20, 1988, Ser. No. 208,924

Claims priority, application France, Jun. 18, 1987, 87 08509

Int. Cl.[5] B01D *29/24*

U.S. Cl. 210—232 **7 Claims**

1. Apparatus for purifying a fluid which comprises:

a plurality of tubes each containing at least one fluid treating element adapted to receive said fluid to be purified;

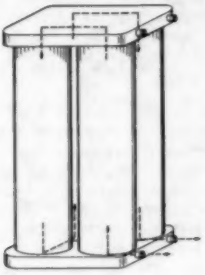
first and second end plates integrally joined to the respective ends of said tubes;

first and second fluid distribution means located respectively within said first and second end plates and being in fluid communication with the ends of said tubes;

means in fluid communication with said first fluid distribu-

tion means for introducing said fluid into said first end plate, said first fluid distribution means directing said fluid through one end of one of said tubes;

said first and second fluid distribution means being adapted to pass said fluid sequentially through each of said tubes to purify said fluid; and



means in fluid communication with said second fluid distribution means for removing purified fluid from said second end plate, whereby said apparatus constitutes a one piece, self contained fluid purification cartridge.

4,944,876

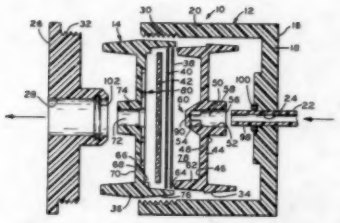
FILTER CAPSULE WITH INLET DISPERSION

Michael R. Miller, Churubusco, Ind., assignor to Telectro-Mek, Inc., Fort Wayne, Ind.

Filed Oct. 3, 1989, Ser. No. 416,714

Int. Cl.[5] B01D *61/18*

U.S. Cl. 210—321.75 **20 Claims**



1. A filter capsule assembly through which a fluid sample is passed in order to filter off particulates suspended therein, wherein the particulates are subsequently analyzed to determine the particulate contamination level of the fluid sample, comprising:

an inlet half including an inlet bottom wall, a fluid inlet opening extending through said inlet bottom wall, and an inlet side wall extending upwardly from said inlet bottom wall, said fluid inlet opening extending along a longitudinal axis substantially normal to said inlet bottom wall and having along the axial length thereof a minimum transverse cross-sectional area;

an outlet half including an outlet bottom wall, a fluid outlet opening extending through said outlet bottom wall, and a generally cylindrical outlet side wall extending upwardly from said outlet bottom wall, said inlet half and said outlet half being adapted to engage one another to define a filter chamber bounded by said inlet and outlet bottom walls and said inlet and outlet side walls;

a filter element retained intermediate said inlet bottom wall and said outlet bottom wall within said filter chamber when said inlet half and said outlet half are engaged; and

means for distributing said particulates on said element in a layer of substatially uniform thickness, including fluid dispersion means associated with said inlet half for radially dispersing a stream of fluid that would enter said filter chamber through said fluid inlet along said longitudinal axis, said fluid dispersion means comprising a fluid-contacting plate member and support means extending between said inlet bottom wall and the peripheral edge of said plate member for supporting said plate member in spaced relationship with said inlet bottom wall, said plate member having a fluid-contacting surface facing said inlet bottom wall in registry with said fluid inlet opening along said longitudinal axis, the area of said fluid-contacting surface being no greater than said minimum transverse cross-sectional area of said fluid inlet opening.

4,944,877

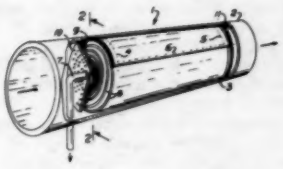
SPACERLESS FEED CHANNEL MEMBRANE FILTER ELEMENT

Paul D. Maples, 820 Los Vallecitos, San Marcos, Calif. 92069

Filed Oct. 10, 1989, Ser. No. 418,873

Int. Cl.[5] B01D *6/108*

U.S. Cl. 210—321.74 **12 Claims**



1. A reverse osmosis filtration device which comprises: means for providing an alternative to a feed/brine spacer material while providing sufficient structured open channel where said spacer material would otherwise have been located, including

a flexible, elongated bladder made from two generally symmetrical sheets of reverse osmosis membrane peripherally bonded together;

said bladder being wrapped into a plurality of spaced-apart layers;

suspending means along two opposite edges of said bladder for spacing-apart said layers and for allowing unrestricted fluid flow from one of said opposite edges to the other between said layers; and

means for draining the bladder.

4,944,878

DECONTAMINATION OF WATER USING NITRATE SELECTIVE ION EXCHANGE RESIN

James E. Lockridge, and James S. Fritz, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 16, 1989, Ser. No. 437,266

Int. Cl.[5] C02F *1/42*

U.S. Cl. 210—683 **6 Claims**

1. A method for nitrate decontamination of water, comprising:

passing water containing nitrate ions through a bed of nitrate selective alkylphosphonium anion exchange resin having pendant alkyl groups of C_3 or larger, thereby removing said nitrate ions from the water.

4,944,879

MEMBRANE HAVING HYDROPHILIC SURFACE

Michael J. Steuck, North Reading, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Jul. 27, 1989, Ser. No. 385,641
Int. Cl.[5] B01D *67/00, 69/00, 71/00*
U.S. Cl. 210—500.27 **57 Claims**

1. A composite porous thermoplastic membrane which comprises a porous membrane substrate having an average pore size between about 0.001 and 10 microns formed of a first polymer, said substrate being directly coated on its entire surface with a cross-linked second polymer formed from a monomer and crosslinking agent polymerized with energy from an electron beam of at least 0.1M rad, said composite porous membrane further comprising essentially the same porous configuration as said porous membrane substrate and properties for providing a porosity loss of less than about 20% when wet.

13. The process comprising: forming a composite porous membrane formed from a porous membrane substrate having an average pore size between about 0.001 and 10 microns formed of a first polymer, said substrate being directly coated over its entire surface with a cross-linked second polymer, said composite porous membrane having essentially the same porous configuration as said porous membrane substrate and providing said composite porous membrane with a porosity loss of less than about 20% when wet by

(a) washing said porous membrane substrate to wet the surfaces of the pores in said porous membrane; and

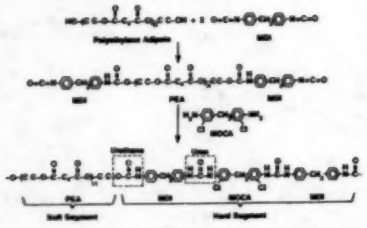
(b) contacting said porous membrane from step (a) with a solution of a monomer of said second polymer, and a crosslinking agent and exposing said monomer to energy from an electron beam of at least 0.1M rad to cross-link said second polymer in situ over the entire surface of said first polymer under conditions to avoid plugging of said pores, said composite porous membrane being characterized by a porosity loss of less than about 20% when wet.

4,944,880

POLYIMIDE/ALIPHATIC POLYESTER COPOLYMERS

S. Winston Ho; Guido Sartori, both of Annandale; Warren A. Thaler, Flemington, and David C. Dalrymple, Bloomsbury, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 16, 1989, Ser. No. 422,385
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 **7 Claims**



1. A method comprising: separating aromatics from feeds which are mixtures of aromatics and non-aromatics by selectively permeating the aromatic hydrocarbon through a thin membrane including a copolymer composition comprising the hard segment of a polyimide and the soft segment of an oligomeric aliphatic polyester, wherein said polyimide is derived from a dianhydride having between 8 and 20 carbon and a diamine having between 2 and 30 carbons and said oligomeric aliphatic polyester is a polyadipate, a polysuccinate, a polymalonate, a polyoxalate or a polyglutarate.

4,944,881

LIQUID SEPARATION MEMBRANE FOR PERVAPORATION

Akira Michizuki; Yoshio Sato; Hisashi Ogawara, all of Kurashiki, and Syuzo Yamashita, Kiyoneson, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 1,727, Jan. 7, 1987, Pat. No. 4,808,313, which is a division of Ser. No. 815,453, Dec. 31, 1985, abandoned. This application Nov. 29, 1988, Ser. No. 277,242
Claims priority, application Japan, Jan. 8, 1985, 60-443; Jan. 30, 1985, 60-14503; Mar. 29, 1985, 60-63429
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 **9 Claims**

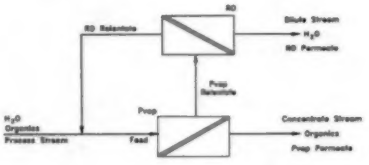
1. A separating method, which comprises feeding a water-organic liquid mixture or an organic liquid-organic liquid mixture to be separated into an upstream side of two chambers partitioned by a separation membrane for pervaporation while reducing the pressure, or maintaining a low vapor pressure, in the downstream chamber to thereby cause a component of the mixture having a higher affinity for the membrane to preferentially permeate through the membrane in the vapor phase, said membrane being composed of a polymeric substance having in the main chain a glycosidic skeleton containing ammonium groups at least some of which are in the form of a salt with acids or groups having a nitrogen atom coordinated with polyvalent metal ions, and/or acidic groups which are in the form of salts with bases at least some of which are polyvalent metal salts.

4,944,882

HYBRID MEMBRANE SEPARATION SYSTEMS

Roderick J. Ray, and David D. Newbold, both of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Filed Apr. 21, 1989, Ser. No. 341,646
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—640 **38 Claims**



1. A method including a combination of membrane separations for the removal of solvent and solute from a process stream containing a solvent and at least one solute with less membrane surface area than would be required for the component membrane separations of said combination or with greater separation than that obtainable with the component membrane separations having the same membrane surface area, said method including a combination consisting essentially of the component membrane separations of

(a) providing a solvent removal process for selectively removing solvent from said process stream, said solvent removal process forming a solvent-rich portion and a solvent-poor portion and being selected from the membrane processes of reverse osmosis, nanofiltration, membrane distillation and pervaporation,

(b) providing at least one selective solute removal process for selectively removing solute from said process stream, said selective solute removal process forming a solute-rich portion and a solute-poor portion and being selected from the membrane processes of pervaporation, supported-liquid membranes, coupled transport, and membrane contactors, and

(c) providing said solvent removal process and said selective

solute removal process as a part of a recycle stream having either of the following relationships:

(1) the solute-poor portion of the selective solute removal process comprises the feed for the solvent removal process and the solvent-poor portion of the solvent removal process is combined with the process stream to form the feed to the selective solute removal process; or

(2) the solvent-poor portion of the solvent removal process comprises the feed for the selective solute removal process and the solute-poor portion of the selective solute removal process is combined with the process stream to form the feed to the solvent removal process.

4,944,883

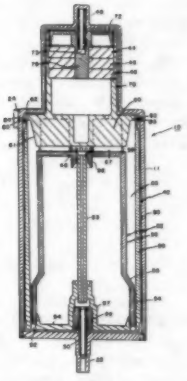
CONTINUOUS CENTRIFUGATION SYSTEM AND METHOD FOR DIRECTLY DERIVING INTERMEDIATE DENSITY MATERIAL FROM A SUSPENSION

Donald W. Schoendorfer, 1842 Whitestone Ter., Santa Ana, Calif. 92705, and Claude E. Berthe, 1303 Hansel La., San Dimas, Calif. 91773

Continuation of Ser. No. 2,804, Jan. 13, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,234

Int. Cl.[5] B01D *45/12*; B04B *1/02*

U.S. Cl. 210—782 **60 Claims**



1. A method of separating from whole blood, a plasma carrier rich in platelets comprising the steps of:

a centrifuging a mass of whole blood about an axis to provide at least partial radial stratification of the mass, the mass being moved along the axis;

propagating axially a number of fluid convective patterns within the at least partially stratified mass to form circumferentially separated zones of plasma rich in platelets;

withdrawing plasma carrier rich in platelets from the separated zone of plasma rich in platelets; and

recirculating blood constituents within a housing and outside the moving mass in a direction opposite a direction of the axial movement, and establishing a higher impedance to flow of the recirculating blood constituents than along the flow path of the axially moving mass.

4,944,884

BODY FLUID PURIFICATION METHOD USING ACTIVATED CARBON FIBERS OF NOVOLOID RESIN ORIGIN

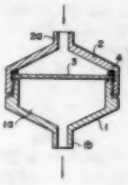
Keiji Naoi, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 300,744, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 48,057, May 11, 1987, abandoned. This application Dec. 18, 1989, Ser. No. 453,361

Claims priority, application Japan, May 14, 1986, 61-109921

Int. Cl.[5] B01D *15/04*

U.S. Cl. 210—692 **3 Claims**



1. A method for removing histamine or serotonin from body fluid comprising

providing a housing defining a body fluid flow path and a filter consisting essentially of activated carbon fibers, arranged in said housing in a position to traverse said body fluid flow path, said activated carbon fibers being made from novoloid fibers by baking and activating said novoloid fibers;

catching and adsorbing histamine or serotonin from the body fluid by passing said body fluid along said flow path and through said filter; and

recovering the body fluid from the housing.

4,944,885

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

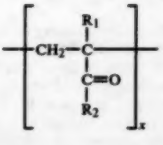
Continuation of Ser. No. 220,195, Jul. 18, 1988, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Oct. 5, 1989, Ser. No. 417,380

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

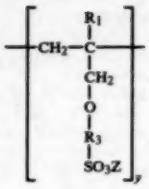
Int. Cl.[5] C02F *5/10*

U.S. Cl. 210—701 **9 Claims**

1. A method of controlling the deposition of calcium phosphate on the structural parts of a system exposed to an aqueous medium containing said calcium and phosphate ions under deposit forming conditions, said method comprising adding to said aqueous medium at least about 10 ppm of a water soluble polymer comprising repeat unit moieties (a) and (b) wherein said repeat unit (a) comprises the structure



and wherein said repeat unit (b) comprises the structure



wherein each R_1 is independently H or lower alkyl (C_1–C_3); R_2 is OH, or OM; M is a water soluble cation; R_3 is 2-hydroxypropylidene; and Z is H or hydrogen atoms or a water soluble cation or cations which together counterbalance the valence of SO_3; and the molar ratio x:y of said polymer being between about 8:1 to 1:5.

4,944,886

METHOD OF SEWAGE TREATMENT

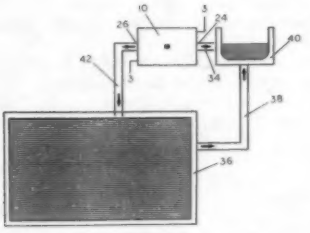
Saad A. Masri, 36 Wildwood Road West, Lethbridge, Alberta, Canada T6K 6C6

Filed Mar. 20, 1989, Ser. No. 325,432

Claims priority, application Canada, Nov. 23, 1988, 583868

Int. Cl.[5] C02F *1/36*

U.S. Cl. 210—748 **7 Claims**



1. A method of sewage treatment, comprising the steps of:

a. firstly, directing the sewage to be treated into a first tank in which a mechanical rake is rotatably mounted to screen out coarse solids;

b. secondly, passing the sewage into a second tank and subjecting the sewage in said second tank to ultrasonic vibrations in a range between 15 and 150 kilohertz for a period in excess of 12 seconds through use of a plurality of ultrasonic probes mounted on one or more arms which rotate in the second tank thereby achieving cavitation of the sewage;

c. thirdly, draining liquids from the sewage;

d. fourthly, removing sewage residue remaining after drainage of liquids.

4,944,887

REGENERATIVE DIATOMACEOUS EARTH FILTER

Stanley H. Frederick, Sanford, N.C., assignor to Essef, Chardon, Ohio

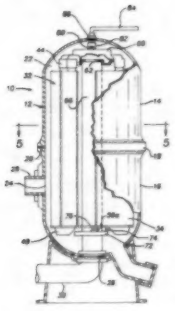
Filed Jan. 13, 1989, Ser. No. 296,611

Int. Cl.[5] B01D *37/02*

U.S. Cl. 210—778 **13 Claims**

1. A fluid filter comprising a casing defining a fluid chamber and inlet and outlet apertures to and from said chamber to respectively conduct unfiltered fluid to said chamber and filter fluid from said chamber, means defining a flow path within said chamber between said apertures, filter means interposed in said flow path substantially normal to a direction of flow of said fluid within said chamber, said fliter means comprising screen means defining a filter compartment having a covering of a filter aid on an upstream side of said screen means, and means to regenerate said filter aid by removing said filter aid from said screen means, including means to rotationally reciprocate said screen means relative to said casing and in an arcuate reciprocation path corresponding to the path definded by the direction of flow through said filter means and further including stop means at both ends of said path to limit the extent of said reciprocation path, the extent of said path permitting fluid to flow entirely through said compartment upon reciprocation of said screen means.

12. A method of filtering fluid with a filter aid deposited on screen means and for regenerating impurity-laden filter aid on the screen means, comprising the steps of entraining a quantity



of filter aid in an impurity-laden stream of fluid to be filtered, causing said fluid to flow through said screen means in a direction substantially normal to said screen means to deposit a coating of filter aid as a filter cake on said screen means and to remove impurities from said fluid by entraining said impurities in said filter aid to form an impurity-entrained filter cake, and, after a predetermined amount of impurities has been so entrained, regenerating said filter cake by creasing said flow and, while retaining a body of said fluid about said screen, arcuately reciprocating said screen means relative to said fluid and along a path substantially normal to said screen means to remove said impurity-entrained filter cake, and resuming said flow to redeposit a coating of filter aid as a filter cake on said screen means.

4,944,888

SUSPENSION POLYMERIZATION IN AN ORGANIC MEDIUM

Prakash Mallya, Pasadena; Yehuda Ozari, Arcadia, and Colin C. Smith, Glendale, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 138,509, Dec. 23, 1987, Pat. No. 4,810,763. This application Mar. 6, 1989, Ser. No. 319,530

Int. Cl.[5] B01D *21/26*

U.S. Cl. 210—787 **6 Claims**

1. In a process for the formation of inherently tacky, adhesive microspheres by suspension polymerization in a first liquid media in which the microspheres are insoluble and formed followed by addition of a volatile organic liquid second media to which the formed microspheres are substantially transferred from the first media to form a mixture of the first media and second media containing the microspheres, the improvement which comprises continuously subjecting the mixture in a disc separation to a centrifugal force in excess of about 2,000 times the force of gravity for a time sufficient to separate the first media from the second media containing the microspheres.

4,944,889

LUBRICANT AND SURFACE CONDITIONER FOR FORMED METAL SURFACES

Sami B. Awad, Troy, Mich., assignor to Henkel Corporation, Ambler, Pa.

Filed Aug. 18, 1989, Ser. No. 395,620
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] C10M *137/04*
U.S. Cl. 252—32.5 9 Claims

1. The process of reducing the coefficient of static friction on the outside surface of a metal can and enabling the drying of said can at a lower temperature, comprising applying to said can a liquid lubricant and surface conditioner composition consisting essentially of a watersoluble organic material selected from the group consisting of an ethoxylated fatty acid, an alcohol having at least about 4 carbon atoms and containing up to about 20 mole of ethylene oxide per mole of alcohol, and an ethoxylated alkyl alcohol phosphate ester, said composition having a pH of between about 1 and about 6.5, said organic material being applied to said can in an amount sufficient to lower the drying temperature of said can by from about 25 to about 100° F.

4,944,890

COMPOSITIONS AND PROCESS OF USING IN REFRIGERATION

Thomas M. Deeb; George K. Henry, both of Newark, Del., and Heather L. Bergmann, Fairfax, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 23, 1989, Ser. No. 356,330
Int. Cl.[5] C10M *107/38*
U.S. Cl. 252—54 13 Claims

1. A composition for use in compression refrigeration comprising:

(a) a saturated hydrocarbon having 1–4 carbon atoms that is partially or fully substituted with at least one atom of chlorine or fluorine and having a normal boiling point in the range of −80° C. to +50° C.; and

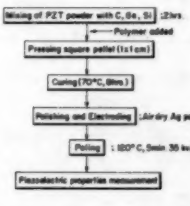
(b) a sufficient amount to provide lubrication of at least one fluorinated hydrocarbon in which the weight ratio of fluorine-to-carbon is from about 0.5 to 5 and having an SUS viscosity at 100° F. of at least 50.

4,944,891

EASILY POLED 0-3 PIEZOELECTRIC COMPOSITES FOR TRANSDUCER APPLICATIONS

Geon Sagong; Robert E. Newnham; Ahmad Safari, and Sei-Joo Jang, all of State College, Pa., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 742,333, Jun. 7, 1985, abandoned. This application Mar. 6, 1987, Ser. No. 22,519
Int. Cl.[5] C04B *35/00*
U.S. Cl. 252—62.9 17 Claims



1. A poled piezoelectric-polymer composite material of 0-3 connectivity for use in transducer applications and which comprises: a matrix of insulating polymer, a piezoelectric ceramic powder dispersed within said polymer matrix and an inorganic conductive or semiconductive particulate third phase additive dispersed within said polymer matrix, said inorganic third phase additive having an electrical conductivity greater than the electrical conductivity of said insulating polymer matrix, said composite being poled in a poling field strength of at least 20 kilovolts per centimeter.

4,944,892

FUNGICIDAL AND ALGICIDAL DETERGENT COMPOSITIONS

Amy Z. Leathers, Allison Park, and S. Thomas Greer, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 46,748, May 7, 1987, Pat. No. 4,806,263, which is a continuation-in-part of Ser. No. 815,493, Jan. 2, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 254,017
Int. Cl.[5] C11D *3/48, 3/12*
U.S. Cl. 252—92 10 Claims

1. A non-film forming, aqueous cleaning composition comprising:

(a) from 0.1 to 0.4 percent by weight of said composition of a water-insoluble compound selected from the group consisting of diiodomethyl p-tolyl sulfone, N-(trichloromethylthio) phthalimide, N,N-dimethyl-N'-phenyl-N'-(fluorodichloromethyl thio) sulphamide, imazalil, and a mixture of 2-(thiocyanomethylthio) benzothiazole and methylene bis(thiocyanate);

(b) from 1.0 to 6.0 percent by weight of said composition of a detergent;

(c) a thickener present at a level sufficient that said composition has a viscosity at 25 degrees C. of between about 200 and about 4,000 centipoise;

(d) an oxidizing agent which can provide an amount of chlorine to said composition, calculated as elemental Cl, in a range of from 0.17 to 0.50 percent by weight of said composition; and

(e) water.

4,944,893

REMOVER SOLUTION FOR RESIST

Hatsuyuki Tanaka, Samukawa; Masakazu Kobayashi, Kawasaki; Kazumasa Wakiya, Samukawa, and Toshimasa Nakayama, Hiratsuka, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kawasaki, Japan

Filed Sep. 12, 1988, Ser. No. 243,001
Claims priority, application Japan, Sep. 16, 1987, 62-229648
Int. Cl.[5] C09D *9/00*
U.S. Cl. 252—171 7 Claims

1. A remover composition for a resist which comprises, in an add mixture;

(a) an organic remover solution comprising an alkylbenzene sulfonic acid having 7 to 20 carbon atoms and at least one compound selected from the group consisting of phenols halogenated hydrocarbons and aromatic hydrocarbons; and

(b) an actylene alcohol in an amount from 1 to 50,000 ppm by weight based on the organic remover solution.

4,944,894

ETHER FREE ORGANOMETALLIC AMIDE COMPOSITIONS

Vijay C. Mehta; Terry L. Rathman, both of Gastonia, N.C.; Ramiro Sanchez, Greenville, S.C., and Robert C. Morrison, Gastonia, N.C., assignors to Lithium Corporatoin of America, Gastonia, N.C.

Filed Feb. 25, 1988, Ser. No. 160,229
Int. Cl.[5] C09K *3/00*
U.S. Cl. 252—182.12 4 Claims

1. An ether-free lithium magnesium diorganoamide comprising a composition represented by the formula:

$$Li_xMg_y(NR^3R^4)_z$$

wherein R^3 and R^4 are independently selected from the group of hydrogen, primary, secondary and tertiary alkyl groups containing 2 to 20 carbon atoms, cycloalkyl groups containing 3 to 20 carbon atoms and aryl groups containing 6 to 10 carbon atoms, $x+y=1$ and $z=x+2y$ with the proviso that at least one of R^3 and R^4 is other than hydrogen and R^3 and R^4 are not both hydrogen.

4,944,895

PROCESS FOR PRODUCING LIQUID CRYSTALLINE COMPOSITES

Alan Buckley, Berkeley Heights; Tessie M. Che, Westfield; Thomas M. Leslie, Clinton Township; James B. Stamatoff, Westfield; Dagobert E. Stuetz, Watchung, all of N.J., and Donald R. Ulrich, Alexandria, Va., assignors to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 15,757, Apr. 10, 1987, Pat. No. 4,814,211. This application Aug. 24, 1988, Ser. No. 235,515

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[5] **C09K** *19/52, 19/00;* **G02F** *1/13*

U.S. Cl. 252—299.01 **4 Claims**

1. A process for producing a composite composition comprising a homogeneous inorganic oxide glass monolith with a microporous structure containing a liquid crystalline component, which comprises hydrolyzing tetraalkoxysilane under acidic or basic pH conditions in a sol-gel reaction medium comprising water, a water-miscible organic solvent and a liquid crystalline component, until gellation of the reaction medium is completed, and removing the solvent medium to provide a porous glass monolith with incorporated liquid crystalline component; wherein the glass monolith microporous structure has an average pore diameter in the range between about 50–300 angstroms, and substantially all of the pore diameters are within about a 100 angstrom diameter variation range.

2. A composite composition produced in accordance with the sol-gel process of claim 1.

4,944,896

SIDE CHAIN LIQUID CRYSTALLINE POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence; James B. Stamatoff, Westfield, and Alan Buckley, Berkeley Heights, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 822,090, Jan. 24, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 219,866

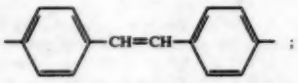
Int. Cl.[5] **F21V** *9/00, 11/00*

U.S. Cl. 252—587 **2 Claims**

1. In an electrooptic light modulator device with a polymeric nonlinear optical component the improvement which comprises a transparent solid medium of a thermotropic liquid crystalline polymer having a comb structure of mesogenic side chains which comprises at least about 25 weight percent of the polymer, wherein the polymer has a glass transition temperature above about 40° C., and the mesogens exhibit a second order nonlinear optical response of conjugated electronic origin, and wherein the polymer has a stable orientation of an external field-induced alignment of mesogens, and wherein the polymer is characterized by a recurring monomeric unit corresponding to the formula:

where P' is a polyvinyl main chain; m is an integer of at least 3; S' is a flexible spacer group having a linear chain length of between about 1–25 atoms; X is —NR—, —O— or —S—; R is hydrogen or a C_1–C_4 alkyl group; Y is

or



and Z is $-NO_2$ in the polymer formula.

4,944,897

ARRANGEMENT IN A FUEL SYSTEM

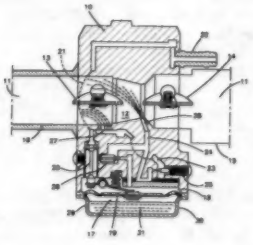
Bo C. Andreasson, Kungälv, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 3, 1989, Ser. No. 306,806

Claims priority, application Sweden, Feb. 5, 1988, 8800371

Int. Cl.[5] **F02M** *15/06*

U.S. Cl. 261—35 **5 Claims**



1. In a fuel system of an engine having a membrane-type carburetor including a carburetor body, a flow channel with a venturi, the inlet end of the flow channel connected to an air filter and the outlet end of the flow channel connected to a manifold of the engine; a throttle, and a choke; the lower portion of the carburetor body including an air chamber and a fuel chamber separated by a membrane that controls an inlet valve for fuel entering the fuel chamber, wherein an operating temperature is created in the fuel system when the engine is running, and an after-temperature is created in the fuel system immediately after the engine is stopped,

the improvement, comprising:

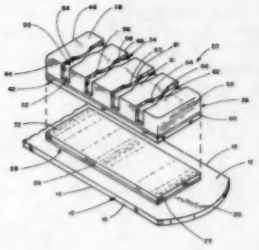
a body of meltable material (31) in a closed volume (30), said closed volume (30) being formed in the lower portion of the carburetor body on the air chamber side of the membrane, said body of meltable material (31) remaining in a solid state when said operating temperature is present in said fuel system and having a melting point lower than the after-temperature present in the fuel system immediately after the engine is stopped whereby said meltable material (31) absorbs heat in said fuel system created by said after-temperature.

4,944,898

CEILING FAN BLADE MOUNTED AIR FRESHNER DISPENSING DEVICE

Stephen B. Glaser, 464 Division Ave., Hicksville, N.Y. 11801

Filed Sep. 26, 1989, Ser. No. 412,342
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—84 5 Claims



1. A ceiling fan blade mounted room deodorant and air freshening product dispenser comprising:

(A) a planar mounting element having adhesive on one surface thereof for attaching said mounting element to a planar surface of a ceiling fan blade and a hook-and-loop fastening means on another surface thereof;

(B) a hollow case containing air freshener product therein and having a planar base with hook-and-loop fastening elements thereon which co-operate with the hook-and-loop fastening means on said mounting element to releasably hold said case on said fan blade, a top surface, side surfaces and end surfaces connected to said planar base; and

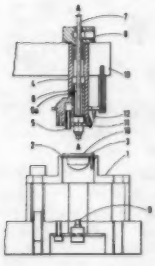
(C) an air flow control means for increasing the air velocity relative to said air freshener product over the air velocity relative to said case as said fan blade rotates, said air flow control means including a channel defined in said case top surface and a converging/diverging section in said channel.

4,944,899

PROCESS AND APPARATUS FOR CASTING LENSES

Albert H. Morland, Lower Swanwick, and Timothy J. Warren, Bursledon, both of England, assignors to CooperVision, Inc., Palo Alto, Calif.

Continuation of Ser. No. 840,781, Mar. 18, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 119,269
Claims priority, application United Kingdom, Mar. 19, 1985, 8507007
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—1.4 11 Claims



1. A process for casting contact lenses using male and female mold halves formed from a light transmissive thermoplastic polymer which comprises:

(a) placing a polymerisable liquid composition in the female mold half,

(b) guiding the male mold half into the female mold half along a substantially vertical path passing through the axes of the male and female mold halves,

(c) detecting the moment of initial contact between the male mold half and the surface of the polymerisable liquid composition,

(d) simultaneously with the detection of said initial contact releasing said male mold half,

(e) applying a closing pressure to said mold halves to thereby define a closed mold cavity filled with said liquid polymerisable composition, and

(f) while maintaining said closing pressure, causing the polymerisable liquid composition to cure and then removing the lens from the mold.

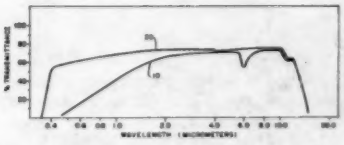
9. Apparatus for casting lenses by placing a volume of a liquid polymerizable composition in a light transmissive female mold, inserting and positioning a light transmissive male mold in the female mold, said apparatus comprising a substantially horizontal support for the female mold, a holder for releasably holding the male mold, means for moving the male mould in said holder towards and into the female mold along a substantially vertical path passing through the axes of the molds and means for detecting contact between the male mold and the surface of the liquid composition and causing said holder to release the male mold.

4,944,900

POLYCRYSTALLINE ZINC SULFIDE AND ZINC SELENIDE ARTICLES HAVING IMPROVED OPTICAL QUALITY

Charles B. Willingham, Framingham, and James Pappis, Westwood, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 473,983, Mar. 16, 1983, abandoned, which is a continuation of Ser. No. 220,944, Dec. 29, 1980, abandoned. This application Jun. 14, 1984, Ser. No. 619,642
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—1.2 10 Claims



1. A method of treating a transmissive body of zinc sulfide of zinc selenide having electromagnetic energy absorbing impurities therein to increase the optical transmissivity of such body, comprising the step of reducing such absorbing impurities comprising wrapping said body in a platinum foil, heating said body to a temperature in the range of 700° C. to 1050° C. and applying, simultaneously with such heating, isostatic pressure to said body of at least 5000 psi, such heating and pressure being applied for a time duration of at least three hours.

4,944,901

METHOD OF MAKING DENTAL COPINGS

Lloyd A. Kwok, 6170 Skyline Blvd., Burlingame, Calif. 94010

Filed Apr. 14, 1988, Ser. No. 181,569
Int. Cl.[5] A61C *13/08*; B29C *51/10, 51/18*
U.S. Cl. 264—19 8 Claims

1. A method for producing a plurality of dental copings simultaneously, comprising,

providing a die-holding tray having a well or recess, the tray

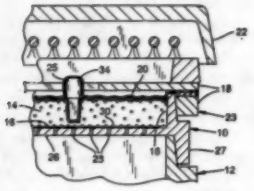
having a plurality of holes through its bottom communicating with the well or recess,

preventing blockage of the holes by positioning a wire mesh over the holes in the bottom of the well or recess,

partially filling the well or recess with a fluid-like mass of lead shot over the wire mesh,

placing a plurality of dental dies, each having a tail piece or pin, into the fluid-like mass of lead shot such that the tail pieces or pins on the dies are submerged into the fluid-like mass of lead shot and held in position by the lead shot, serving as a die holding medium,

laying a sheet of heat-softenable plastic material, retained in



a frame, over the top of the tray so as to cover the recess or well, substantially sealing against air leakage into the well or recess,

applying heat to the sheet from above, to soften the sheet to the extent that it can be deformed into dental copings around the dies,

applying a source of vacuum to the bottom side of the tray so as to apply vacuum to the well or recess up through the fluid-like mass of lead shot and thereby drawing the softened sheet down around the dies using the vacuum to deform the sheet into dental copings, and

removing the heat after the copings have properly formed over the dies, and allowing the copings to cool.

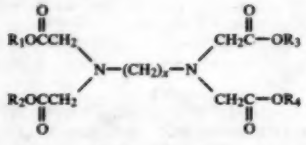
4,944,902

POLYIMIDE COMPOSITIONS AND PROCESSES

Carroll W. Lanier, Baker, La., and Raymond Lee, Elk Grove Village, Ill., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1989, Ser. No. 456,512
Int. Cl.[5] H05B *1/00*
U.S. Cl. 264—25 **9 Claims**

1. A process for preparing a copolyimide foam which includes heating a precursor composition comprising one or more of an aromatic tetracarboxylic acid and a compound of the formula I:



I

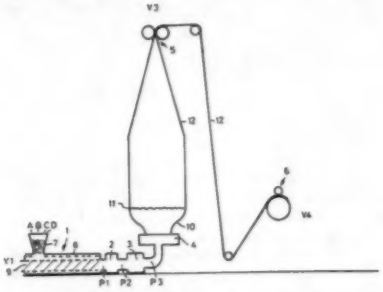
where x is an integer from 1 to 12 and R_1, R_2, R_3 and R_4 are the same or different and are hydrogen, C_1 to C_6 linear or branched alkyl or mixtures thereof with an aromatic or heteroaromatic diamine or mixture of said aromatic and heteroaromatic diamine.

4,944,903

METHOD FOR REGULATING THE WORKING AND THE OUTPUT OF PLASTIC MATERIAL IN EXTRUSION MOULDING

Bo Nilsson, Postbox 3139 K,, Gräsö, S-740 71 Öregrund, Sweden

PCT No. PCT/SE87/00112, § 371 Date Aug. 17, 1988, § 102(e) Date Aug. 17, 1988, PCT Pub. No. WO87/05259, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 5, 1987, Ser. No. 235,884
Claims priority, application Sweden, Jul. 3, 1986, 8601075
Int. Cl.[5] B29C *47/92*
U.S. Cl. 264—40.1 **20 Claims**



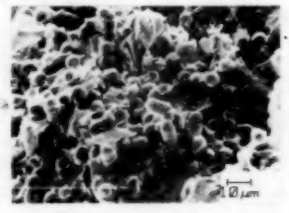
1. A method of controlling the level of kinetics of extrusion and metering out of a plastic material in an extrusion process, by means of an extrusion plant comprising a process unit for melting and mixing the plastic material to form a plastic melt, a pump for metering out the melt to a die, and a screen pack assembly positioned between the process unit and the pump, comprising the steps of maintaining the plastic melt of the process unit at a constant level of kinetics of extrusion, independent of variations in raw material, in flowthrough of the screen pack assembly, and maintaining melt pressure between and screen pack assembly and the pump at a predetermined level.

4,944,904

METHOD OF OBTAINING A FIBER-CONTAINING COMPOSITE

Raj N. Singh, Schenectady, and William A. Morrison, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 66,271, Jun. 25, 1987, abandoned. This application Jul. 8, 1988, Ser. No. 216,488
Int. Cl.[5] C04B *33/36*
U.S. Cl. 269—60 **15 Claims**



1. A process for producing a composite with a porosity of less than about 20% by volume comprised of boron nitride-coated fibrous material and a matrix phase, said fibrous material component of said coated fibrous material comprising at least about 5% by volume of the composite, said matrix phase containing silicon carbide and/or boron-containing silicon carbide formed in situ in an amount of at least about 5% by volume of the composite and a solution of elemental boron and

silicon in an amount of at least about 1% by volume of the composite, which comprises the following steps:

(a) depositing boron nitride on a carbon-containing fibrous material producing a coating thereon which leaves no significant portion of said fibrous material exposed;

(b) depositing a silicon-wettable material on said boron nitride-coated fibrous material producing a coating thereon which leaves no significant portion of said boron nitride exposed;

(c) admixing an infiltration-promoting material containing elemental carbon with the resulting coated fibrous material producing a mixture wherein the fibrous material component of said coated fibrous material comprises at least about 5% by volume of said mixture;

(d) forming said mixture into a preform having an open porosity ranging from about 25% by volume to about 90% by volume of the preform;

(e) providing an infiltrant comprised of boron and silicon containing elemental boron in solution in silicon in an amount of at least about 0.1% by weight of elemental silicon;

(f) contacting said preform with infiltrant-associated infiltrating means whereby said infiltrant is infiltrated into said preform;

(g) heating the resulting structure to a temperature at which said infiltrant is molten and infiltrating said molten infiltrant into said preform to produce an infiltrated product having the composition of said composite, said preform containing sufficient elemental carbon to react with said infiltrant to form said composite; and

(h) cooling said product to produce said composite.

4,944,905

PARTICULATE CERAMIC USEFUL AS A PROPPANT

James L. Gibb, Woodbury, Minn.; James A. Laird, St. Joseph, Wis.; George W. Lee, St. Paul, and William C. Whitcomb, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 571,739, Jan. 18, 1984, Pat. No. 4,680,232. This application Jan. 21, 1986, Ser. No. 820,013

Int. Cl.[5] B29B *9/00*

U.S. Cl. 264—62 **12 Claims**

1. A process of making particulate ceramics, containing alumina and characterized by a greater alumina concentration near the surface than in the interior of the particles, said process comprising the following steps:

(a) mixing and pelletizing with the aid of water, raw materials comprising

a minearl particulate which comprises a ceramic mineral which melts below about 1300° C., does not substantially sublime or volatilize below about 1300° C., vitrifies upon cooling, and has a fired density of less than about 2.9 grams per cubic centimeter;

particulate alumina having a substantially smaller particle size than the mineral particulate; and a binder characterized by adhering the mineral particulate and alumina together into unified masses after pelletizing, but before firing;

(b) drying the wet pellets from step (a);

(c) mixing the dry pellets from (b) with alumina parting agent; and

(d) firing the mixture from (c) at a sufficient temperature and for sufficient time to vitrify the mineral particulate.

4,944,906

METHODS OF INJECTION MOLDING AND EXTRUDING WET HYGROSCOPIC IONOMERS

Paul N. Colby, New Castle, Pa., and Michael F. Durina, Poland, Ohio, assignors to Spirex Corporation, Youngstown, Ohio

Filed Oct. 11, 1988, Ser. No. 255,883

Int. Cl.[5] B29C *45/63, 47/60, 47/76*

U.S. Cl. 264—101 **20 Claims**

1. A method of injection molding a wet hygroscopic ionomer, comprising directly injection molding said wet ionomer using a reciprocating two-stage vented barrier screw having a feed side and an output side and having a barrier flight and a subsequent venting zone, wherein the barrier flight has a melt channel and a solids channel, the melt channel being only partially filled with melted ionomer and having a melt vapor phase adjacent thereto, whereby the vapor phase adjacent to melted ionomer in the barrier flight has access to said venting zone and vents therethrough, and whereby during said injection molding, said ionomer is dried to a degree sufficient that said injection molding is substantially free from problems which would otherwise occur were said wet ionomer to be injection molded without at least said degree of drying.

13. A method of extruding a wet hygroscopic ionomer comprising directly extruding said wet ionomer using a two-stage vented barrier screw having a feed side and an output side and having a barrier flight and a subsequent venting zone, wherein the barrier flight has a melt channel and a solids channel, the melt channel being only partially filled with melted ionomer and having a melt vapor phase adjacent thereto, whereby the vapor phase adjacent to melted ionomer in the barrier flight has access to said venting zone and vents therethrough, and whereby during said extruding, said ionomer is dried to a degree sufficient that said extruding is substantially free from problems which would otherwise occur were said wet ionomer to be extruded without at least said degree of drying.

4,944,907

METHOD FOR MOLDING CONCRETE BLOCKS OR BRICKS

Lindsey B. Davis, Jr., Box 32, Cambridge, Me. 04923

Division of Ser. No. 72,178, Jul. 10, 1987, Pat. No. 4,836,762, which is a division of Ser. No. 815,382, Dec. 31, 1985, Pat. No. 4,702,877. This application Feb. 13, 1989, Ser. No. 251,503

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[5] B28B *1/08*

U.S. Cl. 264—220 **1 Claim**

1. A method for molding concrete elements in an open top mold forming a primary mold cavity, comprising the following steps:

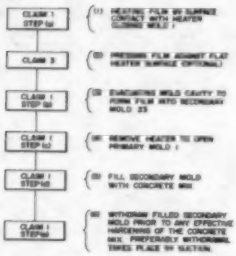
(a) forming a removable secondary mold in said primary mold cavity, said secondary mold being made of moisture resistant synthetic material,

(b) filling said secondary mold in said primary mold cavity with a concrete mix,

(c) compacting said concrete mix in said secondary mold while said secondary mold is still in said primary mold cavity,

(d) withdrawing said secondary mold filled with compacted

concrete mix from said primary mold cavity prior to any substantially noticeable or effective hardening of said concrete mix in said secondary mold which together with said compacted but not yet effectively hardened concrete mix forms a sufficiently shape retaining unti for immediate transportation, and



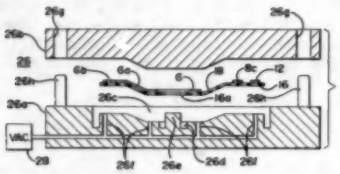
(e) completing the curing and hardening of said concrete mix in said secondary mold outside said primary mold cavity so that expansion forces resulting from hardening and curing of said concrete mix are substantially prevented from becoming effective in said primary mold cavity and for permitting a renewed use of said primary mold cavity before said compacted concrete mix hardens.

4,944,908

METHOD FOR FORMING A MOLDED PLASTIC ARTICLE

Denis J. Leveque, Milwaukee, and Neil A. Czarnecki, Mukwonago, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 28, 1988, Ser. No. 264,115
Int. Cl.[5] B29C *45/14*
U.S. Cl. 264—232 **5 Claims**



1. A method of providing a molded plastic article having a continuous conductive printed circuit embedded in at least two adjoining non-coplanar recessed surfaces of said article with an exposed surface of said printed circuit substantially flush with said recessed surfaces in which it is embedded, comprising:

providing a flexible temporary backing member;

applying an adhesive coating to one surface of said backing member;

providing a conductive printed circuit on said adhesive coating providing an injection mold having a cavity defined by at least two adjoining non-coplanar cavity defining surfaces;

positioning and flexibly conforming said backing concurrently against each said adjoining non-coplanar cavity-defining surface of said injection mold with said conductive printed circuit disposed within said mold cavity defined by said surfaces, said printed circuit extending continuously from one said adjoining cavity-defining surface to another said adjoining cavity-defining surface;

injecting plastic into said mold cavity around three sides of said conductive printed circuit;

releasing said plastic from said mold as said molded plastic article with said conductive printed circuit embedded in said at least two adjoining non-coplanar recessed surfaces of said article and said backing affixed to said conductive printed circuit by said adhesive, said circuit being continuous between said adjoining non-coplanar surfaces; and

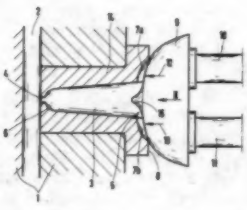
peeling said backing and said adhesive from said conductive printed circuit, leaving a fourth side of said conductive printed circuit forming said exposed surface which is substantially flush with said article surfaces in which it is embedded.

4,944,909

METHOD FOR MANUFACTURING MULTILAYER MOLDED ARTICLES

Helmut Eckardt, Meinerzhagen; Jürgen Ehritt, Hilchenbach-Müsen; Alexander Bockenheimer, Wipperfürth, and Rainer Teschner, Meinerzhagen, all of Fed. Rep. of Germany, assignors to Battenfeld GmbH, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,023
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735099
Int. Cl.[5] B29C *45/16, 45/30*
U.S. Cl. 264—255 **2 Claims**



1. In a method of manufacturing multilayer molded articles of at least two plastics material components having substantially different properties with respect to behavior, processing and/or temperature changes, the method including injecting the plastics material components from different extruder units through a common sprue bushing into a mold cavity of a molding tool, the improvement comprising introducing the plastics material components in a predetermined time sequence initially to different cross-sectional areas of a common sprue cone while simultaneously deflecting the plastics material components toward each other in transverse direction of the sprue cone, subsequently again deflecting the plastic material components in axial direction of the sprue cone and forcing the components in the sprue cone in a converging manner toward a sprue duct of the sprue bushing, and finally spherically deflecting the plastics material components toward each other in transverse direction of the sprue cone and conducting the plastics material components from the sprue cone into the sprue duct of the sprue bushing.

4,944,910

METHOD OF MOLDING THERMOPLASTIC MATERIAL

James W. Hendry, Spring Hill, Fla., assignor to Michael Ladney, Sterling Heights, Mich.

Filed Oct. 17, 1988, Ser. No. 258,556
Int. Cl.[5] B29C *45/63;* B29D *22/00*
U.S. Cl. 264—572 **5 Claims**

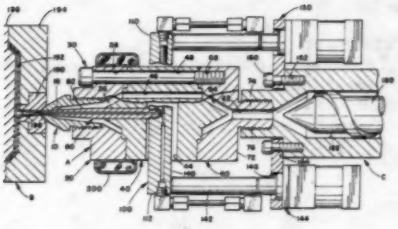
1. A method for molding thermoplastic material, comprising:

providing a nozzle body through which thermoplastic material flows with a valve member having a bore through which a fluid flows;

communicating the nozzle body with a mold space into which the thermoplastic material flows, the mold space being defined by mold surfaces;

actuating the valve member to allow thermoplastic material to flow through the nozzle body into the mold space;

subsequently allowing pressurized fluid to flow through the valve member bore into the thermoplastic material in the



mold space to form a fluid cavity in the thermoplastic material;

actuating the valve member to terminate the flow of thermoplastic material through the nozzle body;

continuing to allow pressurized fluid to flow through the valve member bore into the fluid cavity; and,

subsequently venting the pressurized fluid from the fluid cavity through the valve member bore.

4,944,911

NUCLEAR FUEL ASSEMBLY STRUCTURE COMPACTING DEVICE

Jean A. Beneck, Ormesson, and Guayre Claude, Neuilly Plaisance, both of France, assignors to Framatome, Courbevoie, France

Filed Jun. 8, 1989, Ser. No. 362,995

Claims priority, application France, Jun. 10, 1988, 88 07795

Int. Cl.[5] G21F 9/36

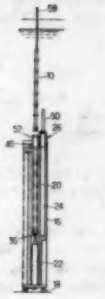
U.S. Cl. 376—261 **9 Claims**

1. Device for compacting a structure of a nuclear fuel assembly devoid of fuel rods, comprising:

a vertically elongated compacting chamber having a vertical axis, whose cross-section is dimensioned to that of a structure to be compacted and which is of sufficient length to receive said structure, in non-fractionated condition;

a compacting jack located at an end of said compacting chamber for axially forcing the structure toward the other end of the chamber and crushing said structure;

a movable unit confronting said other end of the compacting chamber, having a structure reception box and movable transversely to the axis of the chamber between a position for axial introduction of the structure to be compacted into said compacting chamber through said unit and a position in which said reception box forming an abutment member is aligned with the compacting chamber and forms an abutment for the compacted structure; and



an ejection jack carried by said movable unit, arranged to force the structure in crushed condition out of said reception box when energized.

4,944,912

FUEL ROD FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Hartmut Schlomm, Limeshain, and Konrad Martin, Linsengericht, both of Fed. Rep. of Germany, assignors to Reaktor-Brennelement Union GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 244,079

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 3730973

Int. Cl.[5] G21C 3/00

U.S. Cl. 376—420 **5 Claims**

1. Fuel rod for a nuclear reactor fuel assembly, comprising a metal cladding tube having two closed ends, a column of

nuclear fuel pellets disposed in said cladding tube, a compression spring having helical coils and being coaxial with said column of pellets within one of said ends of said cladding tube, a shim having two sides and being disposed between said column of pellets and said helical spring, and a pair of leaf springs on one of said sides of said shim being locked to and biased against said coils of said helical spring.

4,944,913

ABRASIVE AND WEAR RESISTANT MATERIAL

Stephen A. Parsons, 199 Downham Avenue, Mondeor, Johannesburg, Transvaal; Henry B. Dyer, 28 George Street, Bryanston, Transvaal, both of South Africa, and John Dodsworth, 1 Manor Close, Trimdon Village, County Durham, United Kingdom

Continuation of Ser. No. 368,968, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 219,907, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 84,384, Aug. 11, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 449,472

Claims priority, application South Africa, Aug. 11, 1986, 86/6005

Int. Cl.[5] B22F *3/00*

U.S. Cl. 419—13 **10 Claims**

1. A method of producing an abrasive and wear resistant material consisting essentially of a mass of carbide particles, a mass of cubic boron nitride particles and a bonding metal or alloy bonded into a coherent, sintered form, the cubic boron nitride particle content of the material not exceeding 20 percent by weight and the material being substantially free of hexagonal boron nitride, including the steps of contacting a mass of carbide particles and a mass of cubic boron nitride particles with a bonding metal or alloy and sintering the particles and metal or alloy under temperature and pressure conditions at which the cubic boron nitride is crystallographically stable "said pressure being in the range of 50 to 70 kilobars".

4,944,914

TITANIUM BASE ALLOY FOR SUPERPLASTIC FORMING

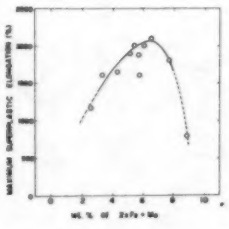
Atsushi Ogawa; Hiroyoshi Suenaga, and Kuninori Minakawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Nov. 30, 1989, Ser. No. 443,930

Claims priority, application Japan, Dec. 24, 1988, 63-327316

Int. Cl.[5] C22C *14/00*

U.S. Cl. 420—418 **23 Claims**



1. A titanium alloy having superplastic forming characteristics consisting essentially of about 5.5 to 6.75 wt. % Al, 3.5 to 4.5 wt. % V, 0.85 to 3.15 wt. % Fe, 0.85 to 3.25 wt. % Mo, with 2×Fe wt. %+Mo wt. % being from 3 to 8, 0.01 to 0.2 wt. % oxygen and the balance titanium; said alloy containing α-crystals having a grain size below about 6 μm in diameter.

4,944,915

COPPER ALLOYS FOR ELECTRICAL AND ELECTRONIC PARTS AND ITS MANUFACTURING PROCESS

Young G. Kim, Seoul, and Yun S. Lim, Inchon, both of Rep. of Korea, assignors to Poongsan Corporation, Seoul, Rep. of Korea

Filed Jun. 8, 1989, Ser. No. 363,535

Claims priority, application Rep. of Korea, Dec. 21, 1988, 17124/1988

Int. Cl.[5] C22C *9/04*

U.S. Cl. 420—479 **1 Claim**

1. A copper alloy having high strength and excellent spring characteristics, consisting of 20 to 27% Zinc, 2.0 to 5.0% Aluminum, 0.5 to 5.0% Nickel, 0.1 to 1.0% Silicon, 0.01 to 0.5% Zirconium, and the balance copper.

4,944,916

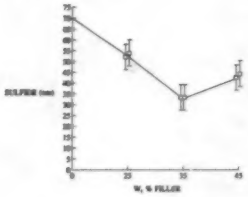
CORROSION INHIBITION

John P. Franey, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 7,105,946, Oct. 8, 1987, abandoned. This application Aug. 23, 1989, Ser. No. 399,427

Int. Cl.[5] C23F *13/00, 15/00*

U.S. Cl. 422—8 **5 Claims**



1. A process for protecting an article including a metal region from corrosion comprising the steps of locating said article in an enclosure, said enclosure having a means for providing said protection comprises particles, said particles comprising a protecting metal chosen from the group consisting of aluminum and copper wherein said particles are embedded in said polymer by introducing and dispersing particulates into said polymer and wherein said surface area of said protecting metal is sufficient to regard said corrosion.

4,944,917

USE OF THIOSULFATE SALT FOR CORROSION INHIBITION IN ACID GAS SCRUBBING PROCESSES

Patrick C. Madden, II, Whippany, and Z. Andrew Foroulis, Mendham, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

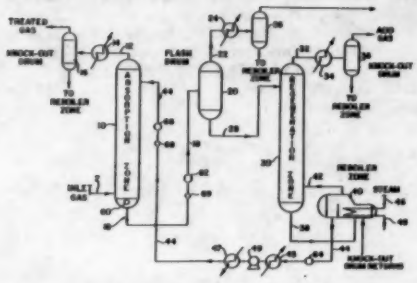
Continuation-in-part of Ser. No. 6/912,258, Sep. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 503,061, Jun. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 398,077, Jul. 14, 1982, abandoned. This application Dec. 28, 1987, Ser. No. 138,630

Int. Cl.[5] C23F *11/06*

U.S. Cl. 422—13 **10 Claims**

1. In a process for removing acidic gases from a gaseous stream containing H2S, wherein said gaseous stream is contacted with an amine-containing scrubbing solution at an elevated operating temperature, the improvement comprising

adding an effective amount of an ammonium or metal thiosulfate salt thereby inhibiting corrosion of metal surfaces in



contact with the acid gas stream containing the scrubbing solution.

4,944,918

STERILIZATION OF BLOOD COMPONENT SEPARATION DEVICES

Jay S. Dessi, Closter, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 15, 1988, Ser. No. 144,214
Int. Cl.[5] A61L *2/08*; G01N *1/00*
U.S. Cl. 422—22 **10 Claims**

1. A method for radiation sterilization of blood component separation containers containing ficoll-hypaque, as one of the separation media therefore, while avoiding precipitation of a sodium component of the ficoll-hypaque during exposure to said radiation sterilization, the steps which comprise

(a) selecting a blood sample separation container for introducing a blood sample therein;

(b) introducing in a first introducing step at least one blood separation component into said container for providing a blood separation medium for said container,

said at least one blood separation component including ficoll-hypaque;

(c) in a second introducing step, introducing into said container a material for adjusting the pH level of said blood separation medium in said container, said material being selected from the group consisting of sodium bicarbonate, sodium bicarbonate with potassium or sodium/mono or dibasic phosphates, sodium carbonate, sodium carbonate with potassium or sodium/mono or dibasic phosphates, tris-hydroxymethyl amino methane with sodium or potassium phosphate, tris-hydroxymethyl amino methane, hydroxyethyl piperazine/N/2/ethane sulfonic acid with sodium or potassium phosphate, and hydroxyethyl piperazine/N/2/ethane sulfonic acid, said material being in an amount sufficient to bring the pH level of said blood separation medium to within the range of between about 6.5 and 7.6 after exposure to radiation sterilization; and

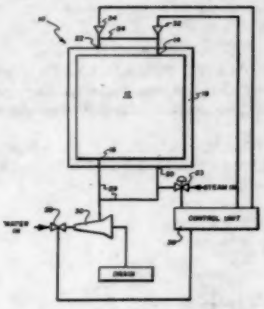
(d) exposing said container to radiation sterilization.

4,944,919

LOW TEMPERATURE STERILIZER

Anthony D. Powell, Lima, N.Y., assignor to MDT Corporation, Torrance, Calif.

Filed May 27, 1987, Ser. No. 54,786
Int. Cl.[5] A61L *2/06*
U.S. Cl. 422—26 **11 Claims**



1. An apparatus for exposing objects to be saturated steam at subatmospheric pressure, comprising:

a sealed chamber with an inlet and an outlet;

a source of steam connected to said inlet through first flow control means;

a source of vacuum connected to said outlet through second flow control means;

temperature sensing means mounted to sense the temperature within said chamber;

pressure sensing means mounted to sense the pressure within said chamber; and

electronic control means operably associated with said first and second flow control means, said temperature sensing means and said pressure sensing means to effect a conditioning phase of operation prior to an exposure phase of operation in a sterilization cycle, said conditioning phase including the steps of:

simultaneously introducing steam through said first flow control means and applying vacuum through said second flow control means, thereby to establish a fluid flow stream through said chamber;

operating said first flow control means in response to the temperature sensed by said temperature sensing means, thereby to establish a preselected exposure temperature within said chamber; and thereafter

operating said second flow control means in response to the pressure sensed by said pressure sensing means to establish an exposure pressure within said chamber at a pressure level at which steam is saturated at said exposure temperature, while continuing to operate said first flow control means to maintain the temperature within said chamber at said exposure temperature.

4,944,920

NOVEL METHOD TO TREAT BLOOD

Alan I. Rubinstein, Los Angeles, Calif., assignor to University of Southern California, Los Angeles, Calif.

Continuation of Ser. No. 892,058, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 838,253, Mar. 10, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 316,604
Int. Cl.[5] A61L *2/18*; C07K *15/06*
U.S. Cl. 422—37 **20 Claims**

1. A method for reducing the infectivity of HIV-1 virus that causes AIDS; said method comprising the steps of:

preparing a disinfectant from lactic acid and sodium chlorite,

each in concentration of less than two percent, in a solution of normal saline;

then exposing a substance comprising red blood cells to the disinfectant for a time period sufficient to inactivate HIV-1 virus; and

then washing the red blood cells with normal saline until the concentration of disinfectant is insignificant.

4,944,921

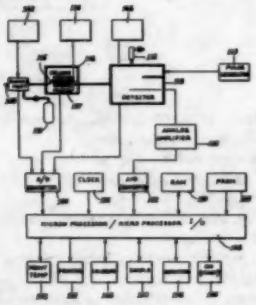
AUTOMATED PCB ANALYZER SYSTEM

Bruce N. Colby, Carlsbad, and Eugene A. Burns, Solana Beach, both of Calif., assignors to Maxwell Laboratories, San Diego, Calif.

Filed Mar. 6, 1984, Ser. No. 586,665

Int. Cl.[5] G01N *27/62, 30/70, 30/86*

U.S. Cl. 422—70 **5 Claims**



1. Portable apparatus for field testing to determine the presence of polychlorinated biphenyls (PCBs) in a material which may contain an interfering component and PCBs, said apparatus comprising:

a gas chromatographic column for separating polychlorobiphenyl components and having an input for receiving a sample and an output for providing separated component peaks;

an electron capture detector connected to the output of said column, said detector providing an analog electrical output which varies with magnitude and retention time of component peaks;

an analog to digital converter connected to the detector to convert the output of said detector to a digital signal and provide an output indicative thereof, wherein the output of said converter constitutes sample data;

a microprocessor connected to the output of said converter, said microprocessor including a memory in which is located data regarding magnitudes and retention times for a plurality of standard PCB mixtures, said microprocessor further including means for comparing said sample data with the PCB standard data for recognition of a substantially similar elution pattern therewith and an output for indicating the presence of a PCB in a sample; and

indication means responsive to the microprocessor output for providing indication of the presence of a PCB in a sample, said microprocessor further including means for determining with high certainty that a sample contains a PCB, for determining that a sample may contain a PCB and for determining with high certainty that a sample does not contain a PCB, said microprocessor further including means for causing said indication means to signal that a PCB is present in a sample, further testing of a sample should be undertaken, or no PCB is present in a sample, respectively.

4,944,922

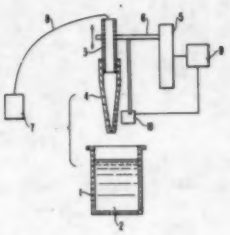
QUANTITATIVE DISPENSER FOR A LIQUID

Hidechika Hayashi, Kanagawa, Japan, assignor to Tosoh Corporation, Yamaguchi, Japan

Continuation of Ser. No. 880,364, Jun. 30, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 338,508

Int. Cl.[5] G01F *11/00*; G01N *1/14*

U.S. Cl. 422—100 **12 Claims**



1. A quantitative dispenser for a liquid, comprising; pipette means having a downwardly directed nozzle adapted to pick up and deliver a predetermined quantity of a liquid, drive means for moving said pipette means downwardly to immerse the lower end of said nozzle in a liquid supply, and liquid supply level sensing means for determining the stopping point for the downward movement of said pipette means, said liquid supply level sensing means being comprised of housing means, lens means mounted in said housing means and having a focal point outside of said housing means, light source means mounted in said housing means for directing a beam of light through said lens means onto the surface of said liquid supply, photosensor means mounted in said housing means for receiving light reflected from said surface of said liquid supply through said lens means, and control means operatively connected to said photosensor means and said drive means for controlling the operation of said drive means so as to stop the downward movement of said pipette means when the maximum intensity of reflected light is detected by said photosensor means,

wherein said lens means comprises two convex lens portions so that said beam of light from said light source means is directed through a first one of said two convex lens portions and said light reflected from said surface passes through a second one of said two convex lens portions which has a focal point on said photosensor means whereby the maximum intensity of reflected light occurs when the surface coincides with the focal point of the first lens portion.

4,944,923

AUTOCLAVE FOR THE PRESSURE DIGESTION OF SAMPLE MATERIALS IN ANALYTICAL CHEMISTRY

Hartmut Heinrichs, Göttingen; Hans-Jürgen Brumsack, Baurat-Gerber-Strasse 3, D-3400 Göttingen; Norman Loftfield, Lange Strasse 22, D-3433 Neu Eichenberg, and Nils König, Göttingen, all of Fed. Rep. of Germany, assignors to Wolfgang Schultz; Hans-Jürgen Brumsack, both of Göttingen and Norman Loftfield, Neu Eichenberg, all of, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,123

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620381

Int. Cl.[5] B01L *3/00*

U.S. Cl. 422—102 **7 Claims**

1. An autoclave vessel for pressure digestion of samples for chemical analysis, comprising: a closeable beaker containing a sample and sustaining elevated temperatures and pressures during operation; a lid in direct contact with said beaker and forming a tight seal therewith; a metallic lid support disc in contact with said lid; clamping means in contact with said lid

support disc and surrounding said beaker and lid for pressing sealing surfaces of said beaker and lid together through pressure on said metallic lid support disc; said sealing surfaces having a periphery in direct contact with outside air to admit outside air free from metallic contaminants into said beaker when said seal is broken due to cooling said vessel after heating thereof; said beaker receiving outside air when said seal is broken for preventing contamination of the sample with metallic constituents; said clamping means applying pressure to said lid through said metallic support disc at a single point to permit said lid to deflect under pressure within said beaker for opening a gap between said sealing surfaces and thereby breaking the seal to relieve the pressure within said beaker through said gap for preventing explosion of said beaker; said periphery being free from confinement by a surrounding wall to prevent permanent deformation of said beaker and lid after said vessel is heated to an elevated temperature and then cooled; said clamping means remaining in place with said lid when pressure within said beaker is relieved through said gap, said metallic lid support disc being a rigid backing of said lid for producing predetermined pivoting action of said lid about said single point to form said gap and prevent destruction of said beaker and lid.

4,944,924

TEST TUBE HOLDER

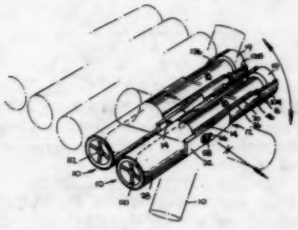
James A. Mawhirt, Brooklyn; Joseph E. DiFlora, Eastchester, both of N.Y.; William J. C. McCandless, Ringwood, N.J., and George H. Ward, So. Ozone Park, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jun. 11, 1987, Ser. No. 61,252

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] B01L *9/06*

U.S. Cl. 422—104 **38 Claims**



1. A test tube holder comprising,

(a) an elongated tubular member, elongated along a longitudinal axis, said tubular member having a first wall portion extending in the direction of said longitudinal axis and a first latch member formed on said first wall portion,

(b) a pivot member supported on said elongated tubular member to permit relative pivotal movement between said pivot member and said tubular member about said longitudinal axis, said pivot member having a second wall portion extending in the direction of said longitudinal axis and a second latch member formed on said second wall portion such that said first and second latch members are relatively moveable toward and away from each other in a radial direction with reference to said longitudinal axis when there is said relative pivotal movement between said pivot member and said tubular member in opposite directions about said longitudinal axis, and said first and second latch members being respectively arranged on said first and second wall portions such that said first and second latch members are unengagable when said pivot member is supported on said elongated tubular member to permit relative pivotal movement between said pivot member and said tubular member about said longitudinal axis.

4,944,925

APPARATUS FOR PRODUCING SINGLE CRYSTALS

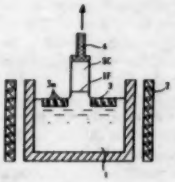
Kazuhisa Yamauchi; Kazuo Sawada, and Yoshihiro Nakai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 85,858, Aug. 14, 1987, abandoned, which is a division of Ser. No. 872,523, Jun. 10, 1986, abandoned. This application May 25, 1989, Ser. No. 357,663

Claims priority, application Japan, Jun. 10, 1985, 60-125765; Jun. 10, 1985, 60-125766

Int. Cl.[5] C30B *35/00, 15/22*

U.S. Cl. 422—249 **4 Claims**



1. An apparatus for growing single crystals, comprising a crucible for holding a melt of material of which said single crystals are to be grown, first separately controllable heating means arranged for heating said crucible to a first melt temperature sufficient to keep said material in a molten state in said crucible, a die located in contact with said melt, said die consisting of a die body forming a melt withdrawing outlet located for pulling a single crystal out of said melt and of second heating means controllable separately and independently of said first heating means, said second heating means being embedded directly inside said die body around said melt withdrawing outlet of said die body so that said die body and said second heating means form a single integral one piece structure for independently and directly heating said die body to a second die temperature sufficiently higher than said first melt temperature for maintaining a well defined temperature gradient between said melt and said die outlet for stabilizing a solid-liquid interface at or near said melt withdrawing outlet of said die body.

4,944,926

METHOD TO TREAT RHODIUM-CONTAINING SOLUTIONS

Akhtar Osman, Clearwater, and William G. Bradford, Sarnia, both of Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Aug. 1, 1988, Ser. No. 226,883
Int. Cl.[5] C01G 55/00; C08C 2/00
U.S. Cl. 423—22 7 Claims

1. A process to treat a rhodium-containing rubber solution obtained from the catalytic hydrogenation of nitrile rubber, said process consisting of:

(i) adding to said solution an additive selected from thiourea, and polysaccharide,

thereby forming a rhodium-containing precipitate which is not soluble in said solution, and

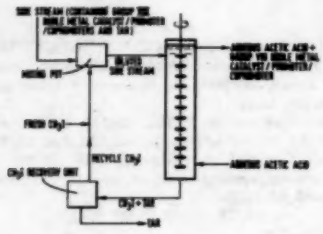
(ii) separating said precipitate from said solution.

4,944,927

PROCESS FOR THE RECOVERY OF METALS

David J. Gulliver, North Humberside, England, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 79,513, Jul. 30, 1987, abandoned. This application May 17, 1989, Ser. No. 355,850
Claims priority, application United Kingdom, Jul. 31, 1986, 8618710
Int. Cl.[5] C01G 55/00
U.S. Cl. 423—22 12 Claims



1. A continuous process for recovering a Group VIII noble metal catalyst from tar generated by the polymerization of ketene or the reaction of ketene with one or more of methyl acetate, acetic anhydride or ethylidene diacetate, which process comprises the steps of:

diluting the tar containing the Group VIII noble metal catalyst with methyl iodide to produce a process stream;

thereafter contacting the diluted tar containing Group VIII noble metal catalyst with an extracting stream comprising acetic acid in water under conditions where the Group VIII noble metal is extracted from the diluted tar into the extracting stream; and

thereafter separating the diluted tar from the extracting stream containing the Group VIII noble metal catalyst.

4,944,928

PROCESS FOR PRODUCING PURE MAGNESIUM OXIDE

Michael Grill, and Gerhard Graf, both of Leoben, Austria, assignors to Veitscher Magnestiwerke-Actien-Gesellschaft, Vienna, Austria

PCT No. PCT/AT88/00048, § 371 Date Feb. 27, 1989, § 102(e) Date Feb. 27, 1989, PCT Pub. No. WO88/10236, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 23, 1988, Ser. No. 342,503
Claims priority, application Austria, Jun. 26, 1987, 1621/87
Int. Cl.[5] C01F 5/06, 5/10
U.S. Cl. 423—161 11 Claims

1. A process for the preparation of pure magnesium oxide from starting materials selected from the group consisting of magnesium silicate and magnesium hydrosilicate materials comprising dissolving the starting material in hydrochloric acid to form a slurry comprising crude brine and residues, separating the residues from the slurry, adding finely ground crude serpentine having a grain size of between 0 and 1mm to the brine as the pH increasing substance for precipitating oxides of iron and aluminum, separating the precipitates and thermally decomposing the magnesium chloride solution thus obtained to obtain magnesium oxide and hydrogen chloride.

4,944,929

PROCESS FOR THE REMOVAL OF NITROGEN OXIDE FROM FLUE GASES

Luc Van Royen, Stabroek; Roland Putseys, Heide-Kalmthout; Willy Van Herck, Brasschaat; Domien Sluyts, Stabroek; Robert Pype, Ekeren, all of, and Karl Brändle, Bergisch Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 16, 1989, Ser. No. 367,001
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821744
Int. Cl.[5] C01B 21/00, 21/20
U.S. Cl. 423—235 11 Claims

1. Process for the removal of nitrogen oxide from flue gases of combustion plants or reaction gases comprising stoichiometrically converting the nitrogen oxide contained in the stream of gas into a composition of N_2O_3 by contact with a sulfuric acid solution, said sulfuric acid solution having a concentration of H_2SO_4 of 30%–70% by weight, and containing from 0.1%–5% by weight nitric acid, at a temperature between 25° C. and 80° C., and removing the N_2O_3 from the gas steam.

4,944,930

SYNTHESIS OF FINE-GRAINED α-SILICON NITRIDE BY A COMBUSTION PROCESS

J. Birch Holt, San Jose; Donald D. Kingman, Danville, and Gregory M. Bianchini, Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 933,438, Nov. 21, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 246,215
Int. Cl.[5] C01B 21/063, 33/06
U.S. Cl. 423—344 6 Claims

1. A method for the combustion synthesis of α-silicon nitride comprising the steps of:

dry mixing silicon powder with an alkali metal azide;

introducing the mixture in a combustion chamber;

pressurizing said chamber with nitrogen at a pressure in the range of about 50 to 100 atmospheres;

igniting said mixture within said chamber; and

isolating said α-silicon nitride formed.

4,944,931

PROCESS FOR PRODUCING NITROSYL FLUORIDE

Mario Mistrorigo, Arzignano; Massimo Barcaro, Vicenza, and Andrea Faccin, San Quirico, all of Italy, assignors to Miteni S.r.L., Cagliari, Italy

Filed Feb. 9, 1989, Ser. No. 308,760
Claims priority, application Italy, Feb. 12, 1988, 19388 A/88
Int. Cl.[5] C01B 21/084
U.S. Cl. 423—386 9 Claims

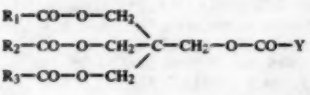
1. A process for preparing nitrosyl fluoride, comprising reacting nitrosyl sulfuric acid with hydrofluoric acid in the liquid phase in the present of water in an amount of at least 2 moles of water per mole of nitrosyl sulfuric acid.

4,944,932
PROCESS FOR PRODUCING CARBON FIBER

Keigo Shiromoto; Yasuo Adachi, and Kiyoyuki Nabae, all of Iyo, Japan, assignors to Toray Industries Inc., Tokyo, Japan

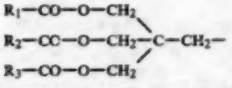
Continuation-in-part of Ser. No. 942,650, Dec. 17, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 251,972
Claims priority, application Japan, Dec. 27, 1985, 60-292815
Int. Cl.[5] D01F 9/12
U.S. Cl. 423—447.6 3 Claims

1. A process for producing an acrylic carbon fiber obtained by heating an acrylic fiber in an oxidizing atmosphere to convert the same into oxidized fiber and heating said oxidized fiber in an inert atmosphere at a higher temperature to carbonize the same, wherein the acrylic fiber is treated with an oiling agent after it is subjected to a water washing step, said oiling agent comprising (a) from 20 to 90% by weight of a neopentyl alcohol derivative represented by the following general formula (I):



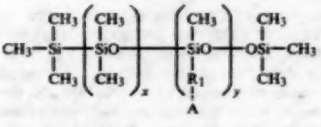
(I)

wherein R_1, R_2, and R_3 are each an alkyl group having 1 to 12 carbon atoms, and Y is an alkyl group having 1 to 12 carbon atoms or is



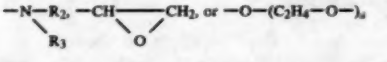
wherein R_1, R_2, and R_3 are each an alkyl group having 1 to 12 carbon atoms,

and (b) 10 to 80 wt. % of a modified polysiloxane represented by the following formula (II):



(II)

wherein R_1 is an alkylene group having 5 or less carbon atoms or an aryl group, x is an integer of 10 to 1000, y is an integer of 1 to 20, A is



wherein R_2 is hydrogen or an alkylene group having 5 or less carbon atoms, R_3 is hydrogen or an alkylene or aminoalkyl group each having 5 or less carbon atoms, and a is an integer of 1 to 50.

4,944,933
PREPARATION OF BASIC ALUMINIUM HALIDES

Peter W. Inward, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 30,194, Mar. 24, 1987, abandoned. This application May 19, 1989, Ser. No. 355,885
Claims priority, application United Kingdom, Mar. 27, 1986, 8707718; Aug. 11, 1986, 8619551
Int. Cl.[5] C01F 7/56
U.S. Cl. 423—462 9 Claims

1. Process of making a basic aluminum chloride in powder form having an aluminum:chloride molar ratio of from 1.7 to 2.2:1 and having a Band III fraction of at least 20% which comprises the steps of:

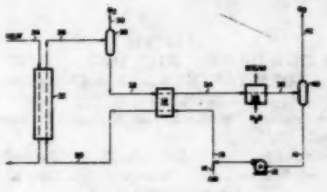
(a) rapidly dissolving metallic aluminum powder which passes a 200 mesh sieve in an aqueous starting solution of aluminum chloride or, a basic aluminum chloride, having an aluminum:chloride molar ratio of up to 1.8:1, said starting solution being held at a temperature of about 50 degrees C. to about 105 degrees C. for a time just long enough to dissolve sufficient aluminum to produce an aqueous solution of a final basic aluminum chloride having an aluminum:chloride molar ratio in the range of 1.7 to 2.2:1, provided that in the case where the starting aluminum compound is a basic aluminum chloride the amount of aluminum dissolved is such that the final basic aluminum chloride has an aluminum:chlorine molar ratio which exceeds by at least 0.3 that of the starting basic aluminum chloride, the concentration of the aluminum in the starting solution and the amount of aluminum dissolved being such that the aluminum concentration in the solution of the final basic aluminum chloride is from 7.5% to 13% by weight, and the reaction being carried out within 5 hours and in such manner that the metallic aluminum powder is dissolved so rapidly that said final basic aluminum chloride has a Band III fraction of at least 20%; and

(b) drying the solution of the final basic aluminum chloride so as to give the final basic aluminum chloride in the form of a hydrated powder having a Band III fraction of at least 20%.

4,944,934
HIGH TEMPERATURE OXYGEN RECOVERY WITH REVERSIBLE CHEMICAL REACTION

Brian R. Dunbobbin, Allentown, Pa.; Richard T. Carlin, Tuscaloosa, Ala., and Anthony A. Cassano, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 3, 1990, Ser. No. 460,467
Int. Cl.[5] C01B 13/00
U.S. Cl. 423—579 7 Claims



1. A continuous process for separating oxygen from air by a reversible chemical absorption at relatively high temperature and desorption at a relatively low temperature comprising the steps of:

(a) contacting air with a liquid slurry of a chemical absorbent for oxygen having a composition of

$$M_xV_2O_5$$

wherein M=Li, Na, K, Ag, or mixture thereof and $0<x<1$, and heating the liquid slurry to a temperature in the range of approximately 630° C. to 870° C. to absorb at least a portion of the oxygen from the air and oxidize the liquid slurry to a predominantly liquid M_2O/V_2O_5 mixture;

(b) separating the oxygen depleted air from the oxidized liquid mixture;

(c) cooling the oxidized liquid mixture to a temperature in the range of approximately 370° C. to 500° C. to desorb oxygen from the liquid mixture and regenerate the liquid slurry; and

(d) separating the oxygen from the liquid slurry.

4,944,935

PROCESS FOR PRODUCING COPPER HYDROXIDE

Bernd Langner, Winsen/Luhe, and Rene-Holger Wilde, Badendorf, both of Fed. Rep. of Germany, assignors to Norddeutsche Affinerie Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 21,486, Mar. 4, 1987, abandoned. This application May 18, 1988, Ser. No. 196,839

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1986, 3606920

Int. Cl.[5] **C01G** *3/02*

U.S. Cl. 423—604 **11 Claims**

1. A process for producing blue copper hydroxide which comprises the steps of:

(a) treating a material containing copper metal at a temperature of 0° C. to 40° C. with an aqueous solution of:

0.1 to 10 g/l of NH_4^+ in an ammonium salt selected from the group consisting of:

ammonium chloride,

ammonium sulfate,

ammonium phosphate,

ammonium nitrate, and

ammonium acetate, and

0 to 5 g/l of a copper(II) salt, and

0 to 1 g/l of ammonium hydroxide calculated as NH_3, with stirring and with simultaneous introduction into said solution of an oxygen-containing gas, at atmospheric pressure in continuous communication with the ambient atmosphere, to produce directly a suspension of solid suspended particles of copper(II) hydroxide at least in part from copper of said material; and

(b) thereafter separating the suspended particles of copper (II) hydroxide produced in step (a) from the solution.

4,944,936

TITANIUM DIOXIDE WITH HIGH PURITY AND UNIFORM PARTICLE SIZE AND METHOD THEREFORE

Earl R. Lawhorne, Savannah, Ga., assignor to Kemira, Inc., Savannah, Ga.

Continuation of Ser. No. 37,204, Apr. 10, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 228,810

Int. Cl.[5] **C01G** *23/047*

U.S. Cl. 423—612 **10 Claims**

1. A method for producing uniform particle size titanium dioxide, comprising the steps of:

(a) providing a quantity of titanium tetrachloride;

(b) adding said titanium tetrachloride to water to form a titanium oxychloride solution having a molar ratio of chloride to titanium of from about 4.0 to about 2.5;

(c) providing a seed suspension of titanium dioxide;

(d) adding said seed suspension to said titanium oxychloride solution;

(e) boiling said solution for a period sufficient to effect precipitation of titanium hydrolysate;

(f) recovering the precipitated titanium hydrolysate at a temperature of less than or equal to about 110° C.;

(g) calcining said precipitated titanium hydrolysate to form free flowing, anhydrous, rutile titanium dioxide having a mean particle size substantially within the range of from about 10 μm to about 40 μm as the final product; and

(h) controlling the rate of precipitation of titanium dioxide and the final product particle size by varying the concentration of the titanium oxychloride solution or the amount of seed added by way of said seed suspension.

4,944,937

COSMETIC STICKS

Patrick C. McCall, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 19, 1984, Ser. No. 683,829

Int. Cl.[5] **A61K** *7/32, 7/34, 7/38, 7/42*

U.S. Cl. 424—65 **20 Claims**

1. A cosmetic stick composition, comprising:

(a) one or more liquid base materials;

(b) a solidifying agent of a type and amount effective to solidify said liquid base materials; and

(c) from about 2% to about 30% (by volume) of chemically inert particulates of at least about 10 microns in diameter and having a density less than about 0.60 g/ml.

4,944,938

ANTIPERSPIRANT AND DEODORANT

A. Chimpirama Potini, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 16, 1988, Ser. No. 285,100

Int. Cl.[5] **A61K** *7/32, 7/34, 7/38*

U.S. Cl. 424—68 **4 Claims**

1. A clear, quick drying highly active antiperspirant and deodorant gel, free of monohydric alcohols which comprises in combination

(a) from about 18 to 26% by weight aluminum chlorohydrate,

(b) from about 15 to 29% by weight water,

(c) from about 13 to 20% by weight isostearyl benzoate emollient,

(d) from about 10 to 20% by weight volatile siloxanes,

(e) from about 14 to 25% by weight cetyl ether emollient,

(f) from about 2 to 6% by weight glycol solubilizers.

4,944,939

SHAVING PREPARATION FOR TREATMENT AND PREVENTION OF PFB (INGROWN HAIRS)

Milton D. Moore, 2940 Holly Hall, Houston, Tex. 77054

Continuation of Ser. No. 132,496, Dec. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 922,076, Oct. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 822,608, Jan. 27, 1986, abandoned. This application Jul. 10, 1989, Ser. No. 378,450

Int. Cl.[5] **A61K** *7/15*

U.S. Cl. 424—73 **7 Claims**

1. A shaving preparation to aid in prevention and treatment of pseudofolliculitis barbae or ingrown hairs, consisting essentially of:

from about 0.1 to 6% by weight salicylic acid;

a glucocorticoid in amount effective to reduce inflammation caused by ingrown hairs;

from about 0.5 to 5% weight sulfur.

4,944,940

BUCK LURE

Leland G. Christenson, II, Rt. 1, Box 27, Eleva, Wis. 54738

Continuation of Ser. No. 92,160, Sep. 2, 1987, abandoned. This application Oct. 13, 1988, Ser. No. 258,076

Int. Cl.[5] **A01N** *25/00*

U.S. Cl. 424—84 **29 Claims**

1. A buck lure kit comprising:

(a) substantially intact deer tarsal gland from one deer; and

(b) a deer scent fluid including deer urine, wherein the deer scent fluid is adapted to admix with the tarsal gland to produce a deer attracting scent.

4,944,941

METHODS AND COMPOSITIONS FOR THE TREATMENT OF LUNG CONDITIONS

Arthur J. Ammann, San Rafael, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Filed Aug. 7, 1987, Ser. No. 83,605
Int. Cl.[5] A61K *37/66, 37/00*
U.S. Cl. 424—85.5 15 Claims

1. A method of treating an individual having or at risk of having idiopathic respiratory distress to increase the surfactant content of the individual's lungs, the method comprising the steps of:

(a) identifying an individual whose lungs may be in need of an increased level of surfactant; and

(b) administering to the individual a composition which includes a therapeutically effective amount of gamma interferon or TNF.

4,944,942

INTRANASAL VACCINATION OF HORSES WITH INACTIVATED MICROORGANISMS OR ANTIGENIC MATERIAL

Karen K. Brown, Kansas City, Mo., and Sharon A. Bryant, Shawnee, Kans., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1987, Ser. No. 90,272
Int. Cl.[5] A61K *39/09, 39/12*
U.S. Cl. 424—89 19 Claims

1. A process of immunizing horses against infection by *Streptococcus equi* comprising applying inactivated organisms, antigenic extracts, or recombinant DNA or synthetic peptide antigens of *Streptococcus equi* to the nasal mucosa or tonsilor tissue of said horses in a dose sufficient to increase the negative log of LD_{50}.

4,944,943

MIXTURE OF A SUBSTANCE HAVING THROMBOLYTIC ACTIVITY AND OF AN ANTITHROMBOTIC SUBSTANCE

Volker Eschenfelder, Wiesloch; Bernhard Schmied, Frankenthal, and Klaus Ruebsamen, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 309,299
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804600
Int. Cl.[5] A61K *37/547, 35/62*
U.S. Cl. 424—94.64 7 Claims

1. A pharmaceutical composition for the treatment of thrombosis, which consists essentially of:

(a) an amount of prourokinase, urokinase, streptokinase or t-PA or a polypeptide having t-PA activity effective for dissolving thrombosis or a combination thereof, or the pharmaceutically acceptable salts thereof, and

(b) an amount of hirudin or a hirudin derivative effective for preventing or impeding the development of blood clots or a combination thereof, or the pharmaceutically acceptable salts thereof.

4,944,944

DIETARY COMPOSITIONS AND METHODS USING BILE SALT-ACTIVATED LIPASE

Jordan J. N. Tang, and Chi-Sun Wang, both of Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Filed Nov. 19, 1987, Ser. No. 122,410
Int. Cl.[5] A61K *37/54;* A23C *9/00;* A23L *2/38*
U.S. Cl. 424—94.6 23 Claims

1. A dietary composition for a human or non-ruminant animal comprising:

a nutritional base from a first source, the base containing fats and being poor in pile salt-activated lipase selected from the group consisting of milk bile salt-activated lipase and bile salt-activated pancreatic carboxylesterase; and

an effective amount of an isolated bile salt-activated lipase derived from a second source to increase fat absorption from the first source and growth of human or non-ruminant animal.

4,944,945

PHARMACEUTICAL COMPOSITION FOR INHIBITING VIRUSES AND INCREASING IMMUNE FUNCTION (PID

Yaguang Lai, 67-08 168th St., Flushing, N.Y. 11365

Division of Ser. No. 6,736, Jan. 27, 1987, Pat. No. 4,886,666.
This application Aug. 21, 1989, Ser. No. 396,332
Int. Cl.[5] A61K *35/78*
U.S. Cl. 424—195.1 1 Claim

1. A process for producing Banlankensu from powdered roots of a plant selected from the group consisting of *Isatis tinctoria* L., *I. indigotica* Fort and *Baphicacanthus cusia* Bremek comprising:

(a) extracting said powder with 95% ethanol at room temperature for 24 hrs;

(b) separating the extract from the powder;

(c) refluxing the separated powder of step (b) twice with ethanol over a water bath for 6 hours, separating the ethanol extracts from the powder, and combining all the extracts;

(d) distilling the extract under reduced pressure to yield a residue;

(e) dissolving the residue in water;

(f) extracting the resulting solution with ether and recovering the aqueous layer;

(g) extracting the aqueous layer with an equal volume of water-saturated butanol;

(h) distilling the water-butanol layer to yield a residue;

(i) dissolving the residue in ethanol;

(k) precitating the Banlankensu with acetone, washing the precipitate twice with acetone and twice with ether; and

(l) drying the Banlankensu.

4,944,946

PHARMACEUTICAL COMPOSITION FOR INHIBITING VIRUSES AND INCREASING IMMUNE FUNCTION (PID

Yaguang Liu, 67-08 168th St., Flushing, N.Y. 11365

Division of Ser. No. 6,736, Jan. 27, 1987, Pat. No. 4,886,666.
This application Aug. 21, 1989, Ser. No. 396,331
Int. Cl.[5] A61K *35/78, 31/715*
U.S. Cl. 424—195.1 1 Claim

1. A process for producing polysaccharide of Wang Qi from powders of *Astragalus membranaceus Bge*; or other Astragalus species comprising:

(a) extracting said powder with boiling water and simmering for 60–90 minutes;

(b) separating the resulting extract from the powder;

(c) concentrating the extract under reduced pressure;

(d) precipitating a crude polysaccharide from the concentrated extract by adding 95% ethanol thereto until the ethanol concentration reaches 60%;

(e) recovering the crude polysaccharide by filtration;

(f) dissolving the polysaccharide of step (e) in water and filtering the resulting mixture to yield a filtrate;

(g) concentrating the filtrate under reduced pressure;

(h) precipitating the refined polysaccharide from the filtrate by adding 95% ethanol thereto until the final concentration of ethanol reaches 80%;

(i) allowing the 80% ethanol solution to stand at 4 degrees C. overnight;

(j) recovering the refined polysaccharide and washing with 95% ethanol three times followed by acetone and ether twice each; and

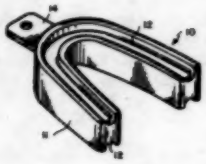
(k) vacuum drying the polysaccharide.

4,944,947

THERAPEUTIC DENTAL APPLIANCE

Martin H. Newman, 77 Norwood St., Sharon, Mass. 02067

Filed Apr. 26, 1988, Ser. No. 186,449
Int. Cl.[5] A61K 7/18
U.S. Cl. 424—435 14 Claims



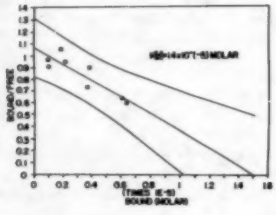
1. A dental appliance useful for treating teeth or mouth tissue, said appliance being in the form of a sterilized block of foam material comprising a mixture of a water-activated, hydrophilic foam prepolymer with an aqueous treatment solution containing a treatment effective amount of a therapeutic composition, said block having a predetermined shape containing said aqueous treatment solution for use as a dental therapeutic device.

4,944,948

EGF/LIPOSOME GEL COMPOSITION AND METHOD

Paul S. Uster, Palo Alto; Robert M. Fielding, Redwood City, and Francis J. Martin, San Francisco, all of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Filed Feb. 24, 1989, Ser. No. 315,392
Int. Cl.[5] A61K 37/22
U.S. Cl. 424—450 30 Claims



1. A high-viscosity liposome composition for use in administering a sustained release dose of epidermal growth factor (EGF) at a wound or surgical incision site, comprising

(a) EGF/liposomes (i) containing neutral phospholipid, between 10–50 weight percent negatively charged phospholipid, and liposome-entrapped EGF; and (ii) having a lipid concentration of at least 50 mg/g composition and a pH between 5.5 and 8.5; and

(b) means for imparting a high composition viscosity selected from the group consisting of:

(i) a low-conductivity aqueous medium containing a zwitterionic compound having an isoelectric point between pH 5.5 and 8.5; and

(ii) empty liposomes which are substantially free of negatively charged phospholipid and entrapped EGF.

4,944,949

PHARMACEUTICAL DELIVERY SYSTEMS

Michael J. Story, Threapwood, and Michael J. Flynn, Surrey, both of England, assignors to T.I.L. Medical Ltd., Middlesex, England

Filed Dec. 17, 1987, Ser. No. 134,243
Claims priority, application United Kingdom, Dec. 18, 1986, 8630273
Int. Cl.[5] A61K 9/66
U.S. Cl. 424—451 15 Claims

1. A method for the treatment of prophylaxis of inflammatory arthropathy, the method comprising the steps of:

providing a non-aqueous formulation of a non-steroidal anti-inflammatory drug and a surfactant, the formulation forming micelles containing the drug on oral administration; and

orally administering said formulation to a patient to be treated.

4,944,950

BAIT COMPOSITION AND INSECTICIDE

Bronislava Sakharova, 605 Washington St., Peekskill, N.Y. 10566

Division of Ser. No. 33,837, Apr. 3, 1987, Pat. No. 4,826,682.
This application Apr. 26, 1989, Ser. No. 343,958
Int. Cl.[5] A01N 59/06, 59/14, 59/18, 59/22
U.S. Cl. 424—623 15 Claims

1. An unctuous cohesive homogeneous insecticidal composition comprising an intimate mixture of the following bait components, in percent by weight:

	%
cucumbers, finely divided whole, hard	10–50
boiled eggs, finely divided	2–20
boiled potatoes, finely divided	15–60
sugar, finely divided	2–20
honey	2–20

and an insecticidally effective amount of an insecticide.

4,944,951

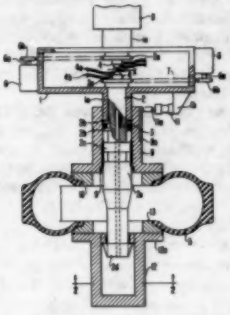
TIRE LOADING MECHANISM OF A TIRE COOLER FOR A TIRE VULCANIZING MACHINE

Hideaki Katayama; Akira Hasegawa, and Katsuyoshi Sakaguchi, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1989, Ser. No. 359,717
Claims priority, application Japan, Jun. 6, 1988, 63-137219
Int. Cl.[5] B29C 35/16
U.S. Cl. 425—58.1 2 Claims

1. A tire loading mechanism of a tire cooler for a tire vulcanizing machine, comprising a main shaft pivotably supported from a rotary table and rotationally driven by a drive source, an outer cylinder mounted to said main shaft so as to be relatively displaceable in an axial direction via screw threads and having an upper bead ring support flange at its lower end, a housing mounted to the lower end of said main shaft via disengageably fitting claws and having a lower bead ring support flange at its upper end, a disengageably fitting rod for stopping rotation of the outer cylinder, that is provided on said rotary

table as opposed to a vertical groove on the surface of said outer cylinder, and means provided between said main shaft



and said outer cylinder for fixedly securing the outer cylinder to the main shaft upon rotational air cooling of the tire

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4,944,952

METHOD FOR PRODUCING PROCESSED MILK CONTAINING GALACTOOLIGOSACCHARIDE

Yoichi Kobayashi; Tatsuhiko Kan, and Tsuneo Terashima, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,719
Claims priority, application Japan, Dec. 24, 1987, 62-325488
Int. Cl.[5] A23C *9/12*
U.S. Cl. 426—42 **4 Claims**

1. A method for producing a milk product containing galactooligosaccharide comprising: admixing an animal milk with a β-galactosidase derived from Streptococcus thermophilus or lactobacillus bulgaricus at a temperature of 40~60° C., a pH of about 6~8, and an enzyme concentration of 1~100 units/ml wherein the amount of glucose generated in the period of 1 hour from the commencement of enzyme treatment is not greater than 30 wt.% of lactose in said animal milk, so as to convert at least 15% of lactose contained in said animal milk into galactooligosaccharide expressed by the following general formula:

$$Gal\text{-}(Gal)_n\text{-}Glc$$

where, Gal represents galactose residue, Glc represents glucose residue and n represents an integer of 1 to 4.

4,944,953

PURIFICATION OF HYDROLYSED PROTEIN WITH CRYSTALLINE ZEOLITE

Guy J. Hartman, and Gary G. Spyres, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed May 19, 1989, Ser. No. 354,543
Int. Cl.[5] A23J *3/30*
U.S. Cl. 426—271 **10 Claims**

1. A method of purifying a hydrolysed protein comprising contacting an aqueous mixture of hydrolysed protein having a chlorohydrin concentration greater than about 50 ppb with a crystalline zeolite agglomerate to reduce the amount of chlorohydrin in said aqueous mixture.

4,944,954

VEGETABLE OIL EXTRACTION PROCESS

Hans R. Strop, and Richard R. Perry, both of Strongsville, Ohio, assignors to EPE Incorporated, Strongsville, Ohio

Division of Ser. No. 855,127, Apr. 23, 1986, Pat. No. 4,808,426.
This application Nov. 14, 1988, Ser. No. 271,002
Int. Cl.[5] C11B *1/00, 3/00*
U.S. Cl. 426—417 **10 Claims**

1. A method of extracting a vegetable oil from an oil-bearing material comprising the steps of:

adding a food oil to the oil-bearing material to form a slurry;

deactivating enzymes present in said slurry;

pasteurizing said slurry; and,

subsequently extracting a physically refinable oil from said slurry, the oil physically refinable without further chemical refining.

4,944,955

MICROWAVABLE, UNCOOKED STARCH-CONTAINING, DRY MIXES

Ivette A. Bassa, East Windsor; Joseph P. Destephano, Mt. Laurel; Jay H. Katcher, Cranbury, and Robert E. Schara, Princeton Junction, all of N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Dec. 7, 1988, Ser. No. 281,118
Int. Cl.[5] A23L *1/187*
U.S. Cl. 426—579 **13 Claims**

1. A dry, food mix which is suitable for both microwave or stovetop preparation by mixing with milk or water and, cooking, said mix comprised of:

(a) up to 80% by weight of sweetening agents, bulking agents or combinations thereof,

(b) 12 to 80% by weight of spray-cooked and dried pregelatinized starch, having a particle size distribution herein at least 30% by weight of the starch is retained on a 270 U.S. Standard Sieve and no more than 1% by weight is retained on an 80 U.S. Standard Sieve;

(c) 8 to 40% by weight uncooked starch, wherein the weight ratio of the pregelatinized starch to cooked starch is 1.5 to 2.5:1;

(d) dispersant in an amount of 0.1 to 2% by weight; and

(e) a cold-water dispersible hydrocolloid gum in an amount of from 0.015 to 3% by weight.

4,944,956

NEW ETHANOLIC COMPOSITIONS CONTAINING ANETHOLE

Bernard Brun, Montpellier, and Pierre Dupont, Sucy-en-Brie, both of France, assignors to Pernod Ricard, Paris, France

Filed Oct. 31, 1989, Ser. No. 429,565
Claims priority, application France, Nov. 7, 1988, 88 14501
Int. Cl.[5] C12G *3/06*
U.S. Cl. 426—592 **11 Claims**

1. A clear ethanolic composition containing anethole, which comprises of at least one waterethanol medium containing from 10 to 30% v/v of ethanol and 1 to 3 g/l of anethole and, in addition, of a quantity, which is effective to keep the composition clear, of a surfactant or of a mixture of surfactants having the following characteristics:

it is acceptable in human foodstuffs,

its HLB is $12<HLB<15$,

the CMC is $10^{-1}>CMC>10^{-3}$,

the haze point being greater than 30° C. for a non-ionic surfactant and the Krafft temperature being less than 10° C. for an ionic surfactant.

4,944,957

PROCESS AND COMPOSITION FOR IMPROVING THE ORGANOLEPTIC PROPERTIES OF SEAFOOD

I. Steven Eingsley, Ridgewood, and Victor S. Turback, South Amboy, both of N.J., assignors to Cuisine Crafts, Inc., Linden, N.J.

Continuation of Ser. No. 15,161, Feb. 17, 1987, abandoned. This application Feb. 9, 1989, Ser. No. 309,946

Int. Cl.[5] A23C *25/00*; A23L *1/325*

U.S. Cl. 426—643 19 Claims

1. A composition useful to improve the organoleptic properties of seafood comprising:

a. about 30 to 97 percent, by weight, salt;

b. about 2.2 to 30 percent, by weight, of an organic acid approved for use in food materials;

c. about 0.5 to 20 percent, by weight, calcium salt;

d. about 0.1 to 15 percent, by weight, of a sweetening agent; and

e. about 0.2 to 37 percent, by weight, of a flavoring/masking agent.

4,944,958

METHOD OF MANUFACTURING A COHESIVE BANDAGE

Gunter Langen, Wolfstein, and Harald Jung, Kreimbach-Kaulbach, both of Fed. Rep. of Germany, assignors to Karl Otto Braun KG, Wolfstein, Fed. Rep. of Germany

Division of Ser. No. 92,084, Sep. 2, 1987. This application Apr. 28, 1989, Ser. No. 345,409

Claims priority, application European Pat. Off., Sep. 5, 1986, 86112283

Int. Cl.[5] A01N *1/02*

U.S. Cl. 427—2 5 Claims

1. A Method of manufacturing a bandage comprising the following steps:

providing a least one layer of woven fabric,

applying a coating to at least one face of the fabric,

said coating including an adhesive substance formed from a foamed aqueous dispersion of 50% one thousand parts polybutylacrylate ester, and two parts alkylphenyl polyethylene glycol, and ten parts stabilizer,

adding to said dispersion a wetting agent and foam stabilizer, said coating being applied by atomization according to an airless method micro-selectively in statistical distribution wherein the quantity of coating is selected by a pump pressure in such a capacity that per fabric side the quantity of coating is 8–10 grams per square meter.

4,944,959

PROCESS FOR ELECTROSTATIC RECORDING COMPRISING CHARGING DIELECTRIC SHEET TO POLARITY OPPOSITE OF IMAGING CHARGE

Hisanori Yagi, Ibaraki; Kousuke Hamada, Amagasaki; Isamu Nakano, Takatsuki; Yoshihiro Nishimura, Amagasaki; Hajime Matsubayashi, Kobe, and Hisashi Tani, Kawanishi, all of Japan, assignors to Kanzaki Paper Manufacturing Company, Limited, Japan

Continuation of Ser. No. 124,591, Nov. 24, 1987, abandoned. This application Aug. 28, 1989, Ser. No. 399,441

Claims priority, application Japan, Nov. 29, 1986, 61-285251; Dec. 5, 1986, 61-291367; Dec. 8, 1986, 61-291894; Mar. 13, 1987, 62-59771; Mar. 30, 1987, 62-80816; Jun. 22, 1987, 62-154901

Int. Cl.[5] G03G *13/048*

U.S. Cl. 427—14.1 19 Claims

1. A process for producing an image of an electrostatic recording medium consisting of an electroconductive support and a dielectric layer formed on the support and containing an insulating resin and a pigment, comprising the steps of forming on the dielectric layer a surface static charge of a polarity opposite to that of a charge to be applied for image formation, applying a charge for image formation to form a latent image and developing the latent image with a toner.

4,944,960

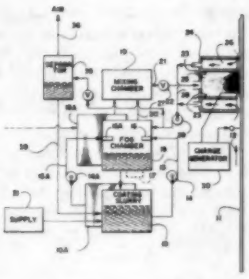
METHOD AND APPARATUS FOR COATING PAPER AND THE LIKE

Patrick J. Sundholm, Smedsintie 7A, Kauniainen SF-0217700, Finland; Robert H. Donnelly, 31 MacMillan, Christchurch 2, New Zealand, and Martti Y. O. Kangas, P.O. Box 2470, Decatur, Ga. 30031

Filed Sep. 23, 1988, Ser. No. 248,177

Int. Cl.[5] B05D *1/06*; B05B *5/14*

U.S. Cl. 427—27 7 Claims



1. A method for coating a paper-like substrate wherein said substrate moves continuously along a path, said method including the steps of providing a plurality of slurries, each slurry of said plurality of slurries comprising a material to be coated on said substrate, breaking up each of said slurries into small particles for producing a plurality of fogs containing said material to be coated on said substrate, mixing said plurality of fogs and directing the resulting mixture towards said substrate for adherence to said substrate, wherein the said step of directing the resulting mixture towards said substrate includes the steps of placing an application nozzle adjacent to said substrate, and providing a positive force for urging said mixture through said application nozzle and towards said substrate.

2. Paper coating apparatus for coating a continuously moving substrate, said apparatus including at least one means for providing a slurry containing solid material to be coated onto said substrate, means for breaking up said slurry into fine particles for creating a fog containing said solid material to be coated onto said substrate, application means for applying said

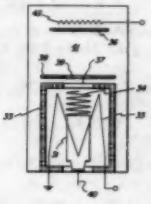
fog to said substrate, said application means being adjacent to and spaced from said substrate and spaced from said means for breaking up said slurry and means for providing a current of gas for entraining said fog and carrying said fog through said application means.

4,944,961

DEPOSITION OF METALS ON STEPPED SURFACES

Toh-Ming Lu, Latham, and Shao-Ning Mei, Wappingers Falls, both of N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Aug. 5, 1988, Ser. No. 228,985
Int. Cl.[5] B05D 3/06
U.S. Cl. 427—38 **16 Claims**



1. A process for coating a stepped surface of a substrate with a metal or metal alloy comprising:

(a) vaporizing the metal or metal alloy,

(b) partially ionizing the vapor to an ion/atom ratio of from about 0.7% to about 5%,

(c) applying a bias potential of at least 500 volts to the substrate to draw the partially ionized vapor to the substrate, and

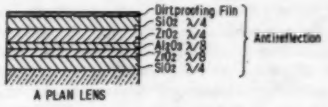
(d) maintaining the substrate at a temperature of at least about 150° C. until a desired amount of the metal or metal alloy has been deposited on the surface.

4,944,962

METHOD FOR DIRTPROOFING TREATMENT FOR PLASTIC LENS

Shoichiro Furuta, Aza-Gohigashi; Hirohisa Kato, Aichi, and Hirohito Seto, Anjo, all of Japan, assignors to Ito Optical Industrial Co., Ltd., Gamagori, Japan

PCT No. PCT/JP88/01079, § 371 Date May 17, 1989, § 102(e) Date May 17, 1989, PCT Pub. No. WO89/04005, PCT Pub. Date May 5, 1989
PCT Filed Oct. 24, 1988, Ser. No. 363,903
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—164 **3 Claims**



1. A method for the impartation of dirtproofness to a plastic lens provided in advance of a film formed by vacuum evaporation, which method comprises the steps of:

(a) mixing a polyfluoroalkyl silane-containing coating liquid and trichlorotrifluoroethane in a gravimetric ratio in the range of ¼ to 1/10 and boiling the resultant mixture,

(b) subjecting said plastic lens to a dip coating treatment in the boiled mixture, and

(c) removing said plastic lens from said boiled mixture and dried with hot air under the conditions of 1 to 5 minutes×40° C. to 60° C. thereby forming a dirtproofing film on said film of vacuum evaporation.

4,944,963

IN SITU CROSSLINKING OF POLYELECTROLYTES

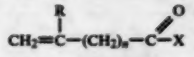
Shmuel Dubi, Highland Park, N.J., and Jayson C. Vassallo, Emmaus, Pa., assignors to McNeil-PPC, Inc., Milltown, N.J.

Division of Ser. No. 86,017, Aug. 17, 1987, which is a continuation-in-part of Ser. No. 749,907, Jun. 28, 1985, abandoned. This application Dec. 11, 1989, Ser. No. 448,392
Int. Cl.[5] B05D 3/02
U.S. Cl. 427—195 **4 Claims**

1. A process for producing absorbent materials comprising:

(a) a carboxylic polyelectrolyte monomer;

(b) a reactive self crosslinking monomer having the formula:



wherein R is selected from the groups consisting of H or CH_3, n is selected from the group consisting of zero or the integers 1 to 5, and X is selected to be a group capable of reacting through self condensation or with carboxylic acid by condensation or ring opening; and

(c) a hydrophobic monomer; wherein whenever X in (b) above is either N-methylol or an N-methylol alkyl ether, the composition has a pH of at least 7;

copolymerizing said monomers to form a poly(electrolyte) self crosslinking copolymer dispersed in water; and drying said dispersion to produce absorbent material comprising crosslinked poly(electrolyte) copolymers.

4,944,964

LACQUER, AND PROCESS FOR PRODUCING ANTI-CORROSION COATINGS

Helmut Schmidt, Höchberg; Helmut Patzelt, Kist; Gerhard Tünker, and Horst Scholze, both of Würzburg, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Division of Ser. No. 185,268, Apr. 18, 1988, Pat. No. 4,840,666. This application May 31, 1989, Ser. No. 359,623
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 3439880
Int. Cl.[5] B05D 1/02
U.S. Cl. 427—203 **5 Claims**

1. A process for the production of anti-corrosion surface coatings, which comprises applying a lacquer to the surface to be coated and then drying said lacquer, wherein said lacquer comprises:

(1) a silicic acid heteropolycondensate prepared by the hydrolysis and polycondensation of:

(a) at least one organosilane of the formula (I):

$$R_mSiX_{4-m} \quad (I)$$

wherein R is alkyl, alkenyl, aryl, arylalkyl, alkylaryl, arylalkenyl or alkenylaryl, X is hydrogen, halogen, hydroxyl, alkoxy, acyloxy or the group —NR'_2, wherein R' is hydrogen or alkyl or both, and m is 1, 2 or 3, and at least one of the following components (b), (c) and (d):

(b) one or more silicon-functional silanes of the formula (II):

$$SiX_4 \quad (ii)$$

wherein X has the above meaning, with the proviso that not all of the radicals X are hydrogen,

(c) one or more oxides, which have low volatility and are soluble in the reaction medium, of an element of main

groups Ia to Va or subgroups IIb Vb of the periodic table or one or more compounds, which forms such an oxide of low volatility, of these elements, and

(d) one or more organo-functional silanes of the formula (III):

$$R_n(R''Y)_pSiX_{(4-n-p)} \quad (III)$$

wherein R and X have the above meaning; R'' is alkylene, arylene, alkenylarylene, alkenylene or alklenearylene, wherein said R'' radicals are uninterrupted or interrupted by oxygen or sulfur atoms or —NH— groups; Y is halogen or an amino, amide, aldehyde, alkyl carbonyl, carboxyl, hydroxyl, mercapto, cyano, alkoxy, alkoxy carbonyl, sulfonic acid, phosphoric acid, acyloxy, methacyloxy, glycidyloxy, epoxy or vinyl group; n is 0, 1 or 2 and p is 1, 2 or 3, with n+p being 1, 2 or 3; and

(2) a filler in flake or lamellar form; and

(3) a solvent for the silicic acid heteropolycondensate.

4,944,965

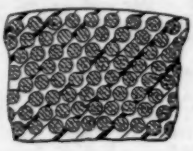
ELONGATED MOLDING GRANULES AND INJECTION-MOLDING PROCESS EMPLOYING THEM

Bruce A. Luxon, Stamford, and Malalur V. Murthy, Wethersfield, both of Conn., assignors to American Cyanamid, Me.

Continuation of Ser. No. 939,597, Dec. 9, 1986, abandoned, which is a division of Ser. No. 744,363, Jun. 13, 1985, abandoned. This application Aug. 18, 1988, Ser. No. 233,582

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—389.7 **19 Claims**



1. A method of manufacturing injection molding granules of dispersible filaments comprising the steps of continuously passing reinforcing filaments through at least one bath of a thermally stable, readily melting film forming non-crosslinkable thermoplastic adhesive, which substantially disperses on contract with hot molten plastic, in a liquid medium to impregnate the filaments, passing the impregnated filaments through a sized opening to remove any excess adhesive, passing the treated filaments into a heated zone first to evaporate the liquid medium and then to flux the thermoplastic adhesive, and withdrawing the treated filaments from said zone and thereafter chopping them into elongated granules whereby there are produced granules comprising 67.5–97.5% by volume of reinforcing filaments extending generally parallel to each other longitudinally of the granule and substantially uniformly dispersed throughout said granule in from 2.5–32.5% by volume of said thermoplastic adhesive which substantially surrounds each of said filament.

4,944,966

PROCESS FOR THE HARDENING OF PHOTOGRAPHIC GELATIN COATINGS AND A COMPOSITE HARDENER FOR GELATIN-CONTAINING COATINGS

Hans Jerenz, Osnabruck, Fed. Rep. of Germany, assignor to Felix Schoeller Jr. GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 16, 1988, Ser. No. 232,933

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1987, 3727293

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—397 **5 Claims**

1. A process for hardening gelatin-containing photographic coatings and auxiliary coatings using an organic hardener comprising:

preparing a premix hardening agent comprising a solution of an effective amount of a substituted 1,3,5 triazine and formaldehyde;

aging said premix hardening agent at least one hour;

adding said premix hardening agent to a photographic gelatin-containing solution after said aging of said premix hardening agent and

coating a paper base with said gelatin-containing solution containing the premix hardening agent.

4,944,967

PROCESS FOR THE PREPARATION OF INFORMATION RECORDING MEDIUM

Masao Yabe, Shizuoka, and Yoshio Inagaki, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 6, 1988, Ser. No. 280,358

Claims priority, application Japan, Dec. 7, 1987, 62-310283

Int. Cl.[5] B05D *3/02*; G11B *7/24*

U.S. Cl. 427—393.5 **7 Claims**

4. A process for the preparation of an information recording medium which comprises the steps of:

coating a solution which contains a polymer in a solvent containing at least 10 weight % of diacetone alcohol over a polycarbonate substrate having a pregroove thereon;

drying thus coated layer to form an intermediate layer; and

forming an information recording layer on the intermediate layer.

4,944,968

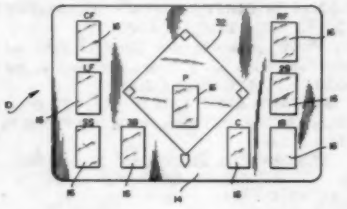
PLACEMAT WITH CHANGEABLE CARD DISPLAY

Eugene Wagner, 3424 Kingsbridge Ave., Bronx, N.Y. 10463

Filed Sep. 14, 1989, Ser. No. 407,195

Int. Cl.[5] G09F *1/10*

U.S. Cl. 428—13 **15 Claims**



1. A display mat for carrying a plurality of display cards, the mat comprising a pliant panel, the panel being dimensioned with a surface area greater than the combined surface area of a plurality of cards, the panel including a like plurality of pockets, each pocket including a substantially rectangular face and further face each having four peripheral edges, means mounting each pocket to the panel in a predetermined array, the panel including an open surface area free of pockets, means for closing each pocket along three peripheral edges and means associated with a fourth peripheral edge of each pocket for insertion and removal of cards into and out of the pocket, the face of each pocket being formed of a transparent, liquid impervious pliant layer of thermoplastic material, the panel being dimensioned with a total surface area greater than the combined surface area of the plurality of pocket faces leaving at least 30% of the total panel surface area as the open surface area free of pockets.

4,944,969

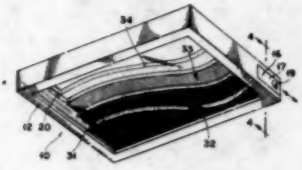
MULTIPURPOSE BOARD LIKE ARTICLE FOR DECORATION AND AMUSEMENT

Nobutane Usui, 36-3, Shimizu 1-chome, Suginami-ku, Tokyo, Japan

Continuation of Ser. No. 6/726,101, Apr. 23, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 127,578

Int. Cl.[5] B44C *5/04*; B44F *1/10*; G09F *19/00*

U.S. Cl. 428—14 16 Claims



1. A multipurpose board for a variable, layered pattern, comprising:

a least three transparent plates;

a supporting frame having support means for supporting the plates by their peripheries in a spaced condition forming respective segregating clearances therebetween;

particles in each segregating clearance between the plates, the particles in each segregating clearance having a physical property which differs from that of the particles in the next adjacent segregating clearance, and the particles in each segregating clearance only partially filling the segregating clearance, whereby to be movable in the segregating clearance upon appropriate movement of the supporting frame.

4,944,970

PACKAGING FILM, IN PARTICULAR A SAUSAGE CASING, BASED ON POLYAMIDE

Karl Stenger, Ruedesheim; Hans Strutzel, Wiesbaden, and Guenther Crass, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,060

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801344

Int. Cl.[5] F16L *11/00*; B65D *81/34*

U.S. Cl. 428—34.8 16 Claims

1. A tubular, biaxially stretch-oriented packaging film which comprises a polymer mixture comprising:

(a) a linear aliphatic polyamide,

(b) a polyterephthalic acid ester,

(c) an aromatic polyamide comprising the reaction product of (i) a branched aliphatic diamine and an aromatic dicarboxylic acid or (ii) an aromatic diamine and an aliphatic dicarboxylic acid, and

(d) a dye.

4,944,971

AUTOMOBILE "SUN VISOR SLIP COVERS"

John P. McLaughlin, 1387 Grouser Rd., Gilbertsville, Pa. 19525

Filed Mar. 21, 1989, Ser. No. 326,739

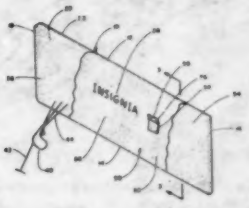
Int. Cl.[5] B65D *65/22*

U.S. Cl. 428—34.9 4 Claims

1. A cover for use on an automobile sun visor having a length and a width, comprising:

a monolithic hollow body which includes end edges and side edges and which is formed of stretchable material that is heat shrinkable upon application of warm air from an element such as a hand-held hair dryer in selected locations, with such selected locations being located only adjacent to said body end edges with areas between said end edges being resistant to heat-induced shrinking, said body having an unstretched and unshrunk shape that corresponds to a shape of an automobile sun visor and having an elongated opening defined through one end edge thereof,

said body material being a plastic wrap type material that is stretchably deformed to permit the sun visor to be inserted into the hollow body through the opening, and being shrinkable upon the application of warm air thereto to the



dimensions of the sun visor positioned inside said body to snugly encase such sun visor,

said opening extending from one of said side edges to a location spaced from the other of said side edges and being smaller than the width of the sun visor so that the cover must be deformed to permit the sun visor to pass through said opening into said hollow body;

fabric material fixed to said body in the area between said selected locations, said fabric material including pockets.

4,944,972

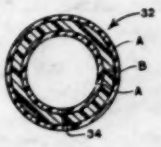
COEXTRUSION APPARATUS, METHODS, AND RELATED FILMS AND PACKAGES

Robert J. Blembereg, Appleton, Wis., assignor to American National Can Company, Chicago, Ill.

Filed Dec. 31, 1987, Ser. No. 140,096

Int. Cl.[5] B32B *1/08*, *27/30*

U.S. Cl. 428—35.2 68 Claims



1. A multiple layer film having two outer surfaces, said film having first and second layers, in surface-to-surface contact with each other, said film having a weld line, said weld line extending, in a single, unbroken path, through said first and second layers, said weld line, comprising said single, unbroken path, extending to, and intersecting, both said outer surfaces.

4,944,973

WRAPAROUND ARTICLE

Martha G. Follette, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 58,609, Jun. 4, 1987, abandoned, which is a continuation of Ser. No. 832,279, Apr. 7, 1986, abandoned, which is a division of Ser. No. 560,344, Dec. 12, 1983, Pat. No. 4,581,265. This application Sep. 13, 1989, Ser. No. 406,883

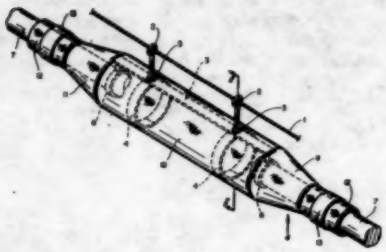
Int. Cl.[5] H02G *15/00*; B32B *31/00*

U.S. Cl. 428—36.1 8 Claims

1. An article comprising:

a shape of material, said shape having two spaced apart

parallel sides joined together at the edges by respective concave sides, said material having a cone penetration value of 100 to 350 (10^{-1} mm) and an ultimate elongation



of at least 200%, wherein the two concave sides adapted for contacting the surface of two elongate substrates and establishing a seal between the substrates.

4,944,974

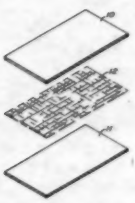
COMPOSITE STRUCTURES OF ULTRA-HIGH-MOLECULAR-WEIGHT POLYMERS, SUCH AS ULTRA-HIGH-MOLECULAR-WEIGHT POLYETHYLENE PRODUCTS, AND METHOD OF PRODUCING SUCH STRUCTURES

Anagnostis E. Zachariades, 65 Glengary Way, Hillsborough, Calif. 94010

Continuation-in-part of Ser. No. 132,200, Dec. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 936,838, Dec. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 811,015, Dec. 18, 1985, Pat. No. 4,655,769. This application Oct. 26, 1988, Ser. No. 262,970

Int. Cl.[5] B32B *27/00, 27/12*

U.S. Cl. 428—36.1 **17 Claims**



1. A single phase composite structure of a filamentary reinforcing component and a non-filamentary matrix component made from the same semicrystalline linear polymer with a weight average molecular weight of at least 500,000, which is capable of forming a pseudo-gel in a solvent compatible with forming such pseudo-gel and of being processed into a high modulus, and high strength fibrillar product with a tensile modulus of at least 10 GPa and a tensile strength of at least 0.5 GPa, said composite structure comprising:

layers of the non-filamentary matrix component of said polymer in sheet form interleaved with at least one layer of the filamentary reinforcing component, also of said polymer, comprised of high modulu high strength fibers.

4,944,975

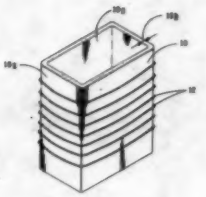
COMPOSITE COIL FORMS FOR ELECTRICAL SYSTEMS

M. Lana Sheer, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1988, Ser. No. 251,773

Int. Cl.[5] B32B *5/08, 5/16;* **H01F** *27/302*

U.S. Cl. 428—36.1 **1 Claim**



1. A coil form for an electrical device comprising:

a structure of an aramid prepreg impregnated with an electrically insulating resin, said structure having a longitudinal passage therethrough, a continuous outer peripheral surface forming support for a coil wound thereon and structural stability and a UL Standard 1446 rating of greater than 200° C., said aramid prepreg having fibers greater than ¼ inch in length, said aramid prepreg being an aramid paper which is a blend of Kevlar ® aramid and a Nomex ® aramid in an 85% to 15% by weight ratio, respectively.

4,944,976

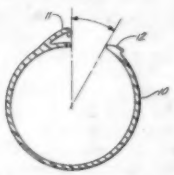
SEMI-RIGID PLASTIC JACKET WITH INTERLOCKING LONGITUDINAL SEAM

Walter A. Plummer, III, Santa Ana, Calif., assignor to The Zippertubing Co., Los Angeles, Calif.

Filed Feb. 17, 1989, Ser. No. 312,735

Int. Cl.[5] F16L *9/00*

U.S. Cl. 428—36.9 **10 Claims**



1. A tubular jacket for enclosing conductors, tubing, cabling, or the like, which jacket has a main body having a longitudinal snap-lock seam effective when closed for maintaining the body stressed in hoop tension and comprising:

an elongated, generally tubular main body of uniform thickness extruded in one piece from a plastic material having a durometer hardness of not less than D50 and formed with snap lock male and female seam forming members along the lateral edge portions of the body and closely spaced apart circumferentially from each other as extruded and prior to being forcibly nested with one another;

said male member consisting of a single asymmetrical hook of generally obtuse triangular shape in cross section, integral with, extending along, and with a portion of thickness greater than the thickness of the body being confined to the exterior of one lateral edge portion of the main body, said triangle comprising an inner side, a longer outer side, and a shorter outer side, with the shorter outer side being

inclined outwardly and away from the adjacent face of the main body at an acute angle to the outer face of the jacket, the inner side being an extension of the interior surface of the main body, and the longer outer side being inclined acutely with the inner side for forming an apex along the lateral edge of the main body; and

said female member being V-shaped in cross section, with the open end thereof facing toward the adjacent apex of the triangular shaped male member, and having a smooth surfaced inner leg of uniform thickness and having an outer leg provided at its outer end with an inwardly projecting hook shaped to interlock with the shorter side of the male member when nested therewith, said hook cooperating with the triangular shaped portion of the male member positioned exteriorly of the main body when nested for holding the seam members strongly and effectively interlocked with the main body stressed in hoop tension.

4,944,977

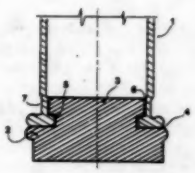
FRICTION WELDING FLASH TRAP SEAL

Ronald B. Shantz, Sheffield, and Robert J. Knight, Guelph, both of Canada, assignors to A.R.D. Industries Ltd., Cambridge, Canada

Continuation of Ser. No. 52,084, May 19, 1987, Pat. No. 4,832,769. This application Apr. 7, 1989, Ser. No. 334,559

Int. Cl.[5] B23K *20/12;* **B29C** *65/06*

U.S. Cl. 428—36.92 **4 Claims**



1. In a friction welded part comprising firstly a hollow cylindrical part defining a cavity and secondly a second part to which said hollow cylindrical part is friction welded, said friction welded part including a friction weld between said hollow cylindrical part and said second part, and an internal flash trap in the region of the weld, said flash trap being defined between said hollow cylindrical part and said second part, the improvement in which one of said hollow cylindrical part and said second part is deformed towards the other part at a location remote from the weld and between the weld and the cavity without a weld formed at said location, so as to seal said flash trap from the cavity.

4,944,978

PIRN MARKER SHEET AND METHOD FOR FORMING THE SAME

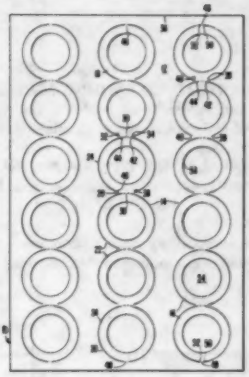
Alfred R. Pipkins, 3776 Court Dr., Theodore, Ala. 36582

Filed Sep. 28, 1989, Ser. No. 413,762

Int. Cl.[5] B32B *3/10*

U.S. Cl. 428—43 **12 Claims**

1. A sheet of circular pirn markers which are removable from the remainder of the sheet as an interconnected row of pirn markers comprising a sheet of material having at least one row of pirn markers formed therefrom and connected thereto, said row including first and second end pirn markers and a plurality of intermediate pirn markers therebetween, each end pirn marker being connected at one side thereof along a line of joinder to an intermediate pirn marker and at an opposite side thereof by a single connection point to the remainder of said sheet, each such end and intermediate pirn markers having



opposed sides defined by continuous opposed arcuate cuts extending through said sheet.

4,944,979

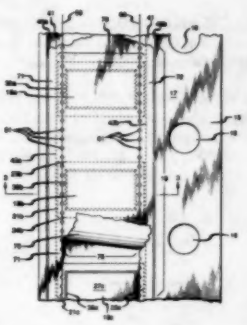
TAPE CONVEYERS FOR COMPONENTS

Francis P. Gagliano, Mountainside, and Solomon L. Hechtlinger, Somerset, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 19, 1989, Ser. No. 423,826

Int. Cl.[5] B65D *85/30, 75/22*

U.S. Cl. 428—43 **15 Claims**



1. The improvement in a component part conveyer comprising: a longitudinally elongated carrier belt, a stock of component parts carried on said belt in a row of such parts extending lengthwise on such belt, an adhesive deposited on said belt in bands flanking such row, and a tape extending in the length of said row over said parts to hold them on said belt, and having regions on laterally opposite sides of said row which are bonded to said adhesive to attach said tape to said belt, said improvement comprising: a pair of tear lines defined in said tape alongside and on opposite sides of the centerline of said row and bounding opposite sides of a strip of said tape extending in its length between said lines, said tear lines being demarcated by discontinuities formed in said tape's structure to weaken its shear strength along such lines, and said lines promoting peeling at the front of said belt of said strip away from border portions of said tape which are on either side of said

strip and remain adhered to said belt, said peeling providing access to ones of such parts on said belt.

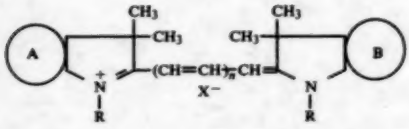
4,944,980

OPTICAL RECORDING MATERIAL

Mitsuo Akutsu, Tokyo; Syuji Iwakura, and Keiji Oya, both of Saitama, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 384,653
Claims priority, application Japan, Aug. 5, 1988, 63-195906
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 **1 Claim**

1. An optical recording material comprising, as an indispensable constituent, a compound of the following general formula:



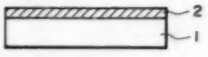
wherein R represents a cycloalkyl group having 3 to 12 carbon atoms, X^- represents a halide anion, a perchlorate anion or a nickel bisdithiolate anion, rings A and B each represent a benzene or naphthalene ring which may be substituted with halogen atom, and n represents 1 to 4.

4,944,981

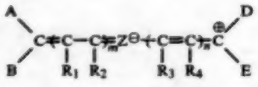
OPTICAL RECORDING MEDIUM

Yoshihiro Oguchi, Yokohama, and Tsuyoshi Santoh, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

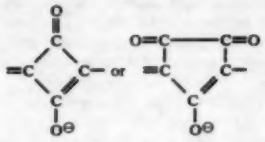
Continuation of Ser. No. 159,350, Feb. 23, 1988, abandoned.
This application Apr. 11, 1989, Ser. No. 336,515
Claims priority, application Japan, Feb. 25, 1987, 62-40416; Feb. 25, 1987, 62-40417; Feb. 25, 1987, 62-40418
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 **3 Claims**



1. An optical recording medium comprising a substrate supporting an organic film, wherein said a polymethine compound represented by



wherein A, B, D and E each represent a hydrogen atom, a substituted or unsubstituted alkyl group, a cyclic alkyl group, an alkenyl group, substituted or unsubstituted aryl group, a substituted or unsubstituted styryl group, a substituted unsubstituted heterocyclic group: R_1, R_2, R_3, and R_4 each representing a hydrogen atom, a halogen atom, or an alkyl group; m and n each represents an integer of 1, 1 or 2; and Z^- represents



4,944,982

INFORMATION RECORDING MEDIUM HAVING MAGNETIZABLE HUB

Yasushi Kikuchi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1989, Ser. No. 332,964
Claims priority, application Japan, Apr. 4, 1988, 63-82820; Apr. 4, 1988, 63-82821
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—64 **8 Claims**

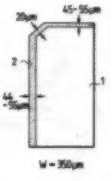
1. An information recording medium comprising an information recording disc for writing or reading information by means of a laser beam which has a circular hole at its center and a magnetizable hub which comprises a boss and a flange and has a hole at its center for insertion of a spindle, wherein the boss of the magnetizable hub has had at its bottom a diameter being equal to or larger than the diameter of the circular hole of the recording disc, and the magnetizable hub has been pushed into the circular hole of the recording disc, whereby the hub is firmly fitted into the hole of the disc.

4,944,983

SLOPED SUBSTRATE FOR A THERMAL HEAD AND METHOD OF MANUFACTURING THE SAME

Osamu Nonoyama, and Masahiro Kato, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 10, 1989, Ser. No. 377,688
Claims priority, application Japan, Jul. 11, 1988, 63-170860; Apr. 14, 1989, 1-94995
Int. Cl.[5] G01D *15/10*; B32B *1/04*
U.S. Cl. 428—81 **3 Claims**



1. A sloped substrate for a thermal head, comprising:
a main plane surface;
a subplane surface which is perpendicular to said main plane surface;
a sloped surface extending between an edge of said main plane surface and an edge of said subplane surface, said

sloped surface having a width in a range between 200 μm to 2,000 μm; and

a glaze bonded by firing to said main plane surface, said subplane surface and said sloped surface, said glaze having a thickness of 100 μm or less.

4,944,984

WINDOW GLASS FOR MOTOR VEHICLES AND A METHOD FOR THE MANUFACTURE THEREOF

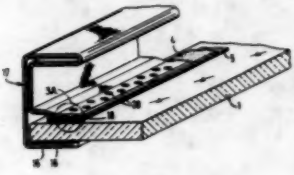
Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Recherche, Aubervilliers, France

Continuation of Ser. No. 28,064, Mar. 19, 1987, abandoned, which is a continuation of Ser. No. 624,122, Jun. 25, 1984, abandoned. This application May 11, 1988, Ser. No. 193,224

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322799

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—83 **2 Claims**



1. A method of manufacturing a window glass for motor vehicles, which, after producing the glass, comprises:

(a) applying a layer of a pasty, curable elastic polymer to the surface of said glass,

(b) curing said elastic polymer layer on the surface of said glass, and

(c) pushing a spring-elastic, force-fitting clamping shaped bracket onto said cured elastic polymer layer to locally partially deform the elastic polymer,

wherein said shaped bracket is provided with holes into which the material of the elastic polymer layer partially penetrates.

4,944,985

METHOD FOR ELECTROLESS PLATING OF ULTRAFINE OR COLLOIDAL PARTICLES AND PRODUCTS PRODUCED THEREBY

Guy B. Alexander, Salt Lake City, Utah, and Ravindra M. Nadkarni, Wrentham, Mass., assignors to Leach & Garner, North Attleboro, Mass.

Filed Apr. 11, 1988, Ser. No. 180,367

Int. Cl.[5] B32B *15/02, 15/04*

U.S. Cl. 428—570 **14 Claims**

1. An ultrafine composite powder consisting of a plurality of ultrafine particles, said particles comprising:

a core portion of material having an average size less than about 20 microns; and

a coating portion comprising a plurality of layers, a first layer adjacent to and contiguous with the surface of said core portion being a complex oxide and each of the other layers being a substantially uniform, stable and dense deposition of at least one metal selected from the group consisting of copper, silver, gold, lead, tin, nickel, zinc, cobalt, antimony, bismuth, iron, cadmium, chromium, germanium, gallium, selenium, tellurium, mercury, tungsten, arsenic, manganese, iridium, indium, ruthenium, rhenium, rhodium, molybdenum, palladium, osmium and platinum.

4,944,986

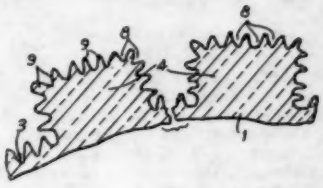
ANTI-REFLECTIVE GLASS SURFACE

David C. Zael, Burnsville, Minn., assignor to Zael Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 248,860, Sep. 23, 1988, abandoned. This application Jan. 13, 1989, Ser. No. 298,332

Int. Cl.[5] C03C *15/00*

U.S. Cl. 428—156 **4 Claims**



1. A glass product composed of an alkali or alkaline earth metal oxide silicate glass, the glass product having high optical clarity, and low reflectance, at least surface of the glass product comprising:

a plurality of scallops extending across the surface of the glass, each scallop being about 100 to 2000 micrometers in diameter,

a plurality of islands disposed on the surface of the scallops at a density of 25 to 500 islands per square millimeter, each of said islands being between about 10 to 20 micrometers in diameter,

said scallops and islands extending across said surface of the glass in such a distribution that said scallops and islands contribute to providing decreased reflectance of incident light across said surface of the glass

a skeletized silicon structure extending uniformly over the entire said surface of the glass including said scallops and said islands, the skeletized structure having openings of about 200 to 600 angstroms uniformly distributed throughout, and

said product having low reflectance of incident light.

4,944,987

HEAT RECOVERABLE ARTICLES

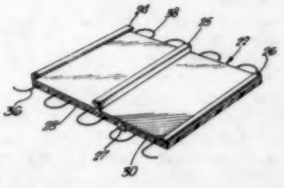
Johannes M. Cordia, Pellenberg, Belgium; Roger W. Evans, Chiseldon, England, and Robert H. Van Loo, Linden, Belgium, assignors to N. V. Raychem S. A., Belgium

Continuation of Ser. No. 203,507, May 25, 1988, abandoned, which is a continuation of Ser. No. 45,267, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 858,541, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 720,214, Apr. 5, 1985, abandoned. This application Feb. 22, 1989, Ser. No. 314,324

Claims priority, application United Kingdom, Apr. 6, 1984, 8408908; Apr. 6, 1984, 8408907; Nov. 28, 1984, 8430088

Int. Cl.[5] H05B *3/10*

U.S. Cl. 428—192 **18 Claims**



1. A heat-recoverable cover comprising a sheet of polymeric material and an elongate electrical resistance heating element which is in thermal contact with the cover and which is arranged to pass back and forth in a direction generally parallel

to the surface of the cover in a serpentine path, the cover having a first closure means positioned toward one end of the sheet and a second closure means spaced apart from the first closure means to define a first cover portion between them, which first cover portion can be wrapped once around an object to be covered and secured in the wrapped configuration by the first and second closure means, the second closure means being spaced from the end of the cover opposite the first closure means to define a second cover portion that can be wrapped at least once around the object inwardly of the first cover portion.

4,944,988

INK JET RECORDING SHEET AND PROCESS FOR PRODUCING SAME

Kenji Yasuda, Yachiyo; Akira Kobayashi, Kasugai; Makiko Tokita, Chiba; Masao Maekawa, Kitakatsuragi; Masahiko Kitajima, Izumi, and Hisao Maruyama, Toyonaka, all of Japan, assignors to OJI Paper Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,032

Claims priority, application Japan, Dec. 29, 1987, 62-334054

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—195 **15 Claims**

1. An ink jet recording sheet comprising:

a substrate sheet; and

at least one coating layer formed on at least one surface of the substrate sheet and comprising a resinous binder and at least a pigment dispersed in the resinous binder,

said resinous binder comprising at least one cationic copolymer which is a copolymerization product of:

(a) 99.95 molar % or less of a principal copolymerization component comprising at least one fatty acid vinyl ester comonomer; with at least

(b) 0.05 to 0.4 molar % of a cationic copolymerization component comprising at least one cationic comonomer having at least one ethylenically unsaturated hydrocarbon radical and at least one cationic radical selected from the group consisting of tertiary amino radicals and quaternary ammonium radicals.

4,944,989

COMPOSITIONS WHICH CROSSLINK IN THE PRESENCE OF MOISTURE AT ROOM TEMPERATURE TO FORM ELASTOMERS

Norman Dorsch, Burghausen; Asivin Sommer, Burghausen; Alvis Strasser, Burghausen, and August Schiller, Neuatteng, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,234

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737458

Int. Cl.[5] B32B *27/28, 17/10*; C08G *77/04*

U.S. Cl. 428—319.7 **10 Claims**

1. A composition which can be stored in the absence of moisture, but crosslinks in the presence of moisture at room temperature to form elastomers comprising a diorganopolysiloxane having terminal condensable groups, a silicon compound having at least three hydrolyzable groups bonded directly to silicon per molecule, in which an average of at least one acyloxy group is present as a hydrolyzable group per silicon atom in the silicon compound and a cyclic diorganopolysiloxane having at least one vicinal epoxy group.

4,944,990

ORIENTED WHITE OPAQUE MULTILAYER HEAT SEALABLE FILM AND METHOD OF FORMING SAME

Leland L. Liu, Macedon, and Patricia A. Cyr, Farmington, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 16, 1988, Ser. No. 208,307

Int. Cl.[5] C09J *7/02*

U.S. Cl. 428—353 **17 Claims**

1. A multi-layer heat sealable structure comprising:

(a) a substrate having a white opaque, cavitated polyolefin film;

(b) a second layer coextruded on at least one surface of said substrate, said second layer including a heat sealable homopolymer, copolymer, terpolymer or blend thereof;

(c) a primer coating on at least one surface of said second layer (b) the surface having been previously treated to increase the energy of the surface; and

(d) a heat sealable layer on said primer coating (c), said heat sealable layer including a vinylidene chloride copolymer containing at least 50% by weight of vinylidene chloride.

4,944,991

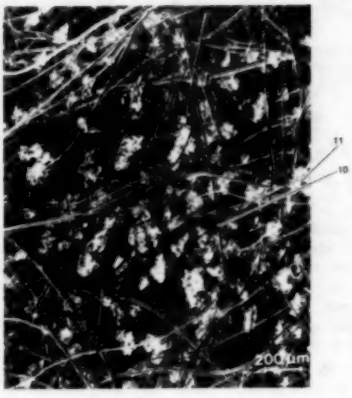
FORMATION OF ALUMINA IMPREGNATED CARBON FIBER MATS

Bradley R. Karas, Amsterday, and Robert W. Powers, Schenectady, both of N.Y., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jul. 8, 1988, Ser. No. 216,890

Int. Cl.[5] C25B *11/06*; B32B *9/04*

U.S. Cl. 428—408 **25 Claims**



19. A carbon mat comprising carbon fibers and nodules of alumina, said nodules being substantially uniformly dispersed throughout said mat.

4,944,992

CUSHION

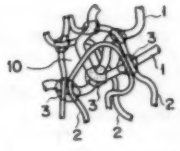
Yasuo Yoneshige, Kawasaki; Atsushi Misumi, Yokohama; Shuji Hiromoto, Chigasaki, and Toru Sakai, Tokyo, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Mar. 7, 1989, Ser. No. 319,749

Claims priority, application Japan, Apr. 14, 1988, 63-92046

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—198 **16 Claims**



1. A cushion comprising:

synthetic cotton consisting essentially of first curled synthetic fibers with a denier value of 20 or more and second curled synthetic fibers with a denier value of less than 20, said first and second synthetic fibers being mixed in the ratio of 0.5 to 2:1 by weight and three-dimensionally intertwined with air-passing space among them; and

a polyurethane binder binding the intersections of the first

and second synthetic fibers, such that said air-passing space is maintained.

4,944,993

TOUGHENED RUBBER BASED HOT MELT ADHESIVE COMPOSITIONS FOR DISPOSABLE APPLICATIONS

Gary Raykovitz, Flemington; Robert Schmidt, Great Meadows, and Paul Puletti, Glen Gardner, all of N.J., assignors to National Starch and Investment Holding Corporation, Wilmington, Del.

Filed Aug. 17, 1988, Ser. No. 233,181
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—290 10 Claims

1. A hot melt adhesive composition suitable for disposable constructions consisting essentially of:

(a) 10 to 40% by weight of a substantially radial styrene-butadiene block copolymer having a styrene content greater than 35% by weight, a modulus at 300% elongation of at least 4.5 MPa and a solution viscosity less than 1000 cps;

(b) 20 to 65% by weight of at least one compatible tackifying resin;

(c) 0.1 to 4% by weight stabilizer; the remainder (to 100%) comprising at least one oil diluent.

4,944,994

TOUGHENED HOT MELT ADHESIVE COMPOSITION FOR BOOK CASEMAKING

Thomas P. Flanagan, Green Brook, N.J., assignor to National Starch and Investment Holding Corporation, Wilmington, Del.

Filed Aug. 17, 1988, Ser. No. 233,173
Int. Cl.[5] G32B *27/00*
U.S. Cl. 428—290 7 Claims

1. A case for a hard cover book formed by bonding the cover boards to the book cover stock using a hot melt pressure sensitive adhesive composition comprising:

(a) 10 to 40% by weight of a substantially radial styrene-butadiene block copolymer, the copolymer having a styrene content greater than about 35% by weight, a modulus at 300% elongation of at least 4.5 MPa and a solution viscosity less than about 1000 cps;

(b) 20 to 65% by weight of a compatible tackifying resin;

(c) 0.1 to 4% by weight stabilizer; and

(d) the remainder (to 100%) comprising a plasticizing oil.

4,944,995

TAPE HAVING A SURFACE WITH A LOW COEFFICIENT OF FRICTION AND LONG WEAR CHARACTERISTICS

John C. Owens, Arvada, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Mar. 10, 1988, Ser. No. 166,257
Int. Cl.[5] B32B *15/08, 27/36*
U.S. Cl. 428—294 7 Claims

1. A tape having a low friction surface comprising:

substrate means manufactured from a conformable elongated material of the group including: polycarbonate or mylar, and having first and second sides;

a plurality of alumina rods, the surface of which has a low coefficient of friction, attached to said first side of said substrate means at a predetermined spacing for providing said first side of said substrate means with a low friction surface.

4,944,996

SEPARATING ELEMENT

Jean-Michel Baner, Pagny S/Moselle; Jacques Maire, Paris, and Maurice Verna, Nice, all of France, assignors to Le Carbone Lorraine, Courbevoie, France

Continuation of Ser. No. 871,824, Jun. 9, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 280,387
Claims priority, application France, Jun. 10, 1985, 85 09264
Int. Cl.[5] B01D *39/20;* B32B *5/24;* C02F *1/44*
U.S. Cl. 428—307.7 15 Claims

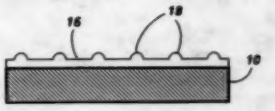
1. A separating element comprising a porous mineral membrane sintered to the face of a carbon-carbon composite material of small thickness permitting high permeability, which is of a strength adapted to resist bursting and which is of a porous texture suited to the mineral membrane.

4,944,997

ELECTROSTATOGRAPHIC RECORDING MATERIAL

Norman A. Nielsen, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 18, 1988, Ser. No. 272,848
Int. Cl.[5] B23B *23/08;* G03Q *13/22*
U.S. Cl. 428—327 12 Claims



1. A coated paper suitable for use in an eletrostatographic process for a toner image formed with a liquid developer, said paper comprising a substrate and bound thereto by a resin binder on at least one side generally smooth surfaced spherical bearing spacer particles having a substantially uniformly particle size of from about 5 to about 15 micrometers extending through the resin binder and being substantially uniformly distributed on at least one side of said substrate.

4,944,998

CHARGE DISSIPATIVE FLOOR TILES

Susan M. Von Stetten, Landisville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 78,899, Jul. 29, 1987, Pat. No. 4,826,912. This application Jan. 26, 1989, Ser. No. 301,595
Int. Cl.[5] C08L *27/06;* B32B *5/16*
U.S. Cl. 428—327 13 Claims

1. A surface covering product having static dissipative electrical properties comprising a composition of a consolidated agglomeration of individual chips of polymeric material wherein a first portion of said individual chips are electrically conductive and a second portion of said individual chips are electrically non-conductive.

4,944,999

CARBONACEOUS FIBER OR FIBER ASSEMBLY WITH INORGANIC COATING

Francis P. McCullough, Jr., Lake Jackson; R. Vernon Snelgrove, Damon; Steven L. Brewster, Lake Jackson, all of Tex., and George C. Higgins, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 163,919, Mar. 4, 1988. This application Jun. 14, 1989, Ser. No. 366,811
Int. Cl.[5] D02G *1/00, 3/00*
U.S. Cl. 428—371 9 Claims

1. An oxygen and thermally stable resilient coated fiber or tow of fibers comprising a non-linear carbonaceous fiber or

fibers having a reversible deflection ratio of greater than 1.2:1, an aspect ratio greater than 10:1 and an LOI value greater than

40, said fiber or fibers having a metallic surface coating whereby said fibers are oxygen or thermally stable.

4,945,000

PARTICULATE THERMOSETTING ADHESIVE COMPOSITIONS

Marcel Widmann, Belleville, and James H. Hickey, Picton, both of Canada, assignors to BTL Specialty Resins Corp., Toledo, Ohio

Filed Jan. 18, 1989, Ser. No. 297,691
Int. Cl.[5] B32B *19/02*; C08K *9/04*; C09J *1/00*
U.S. Cl. 428—407 11 Claims

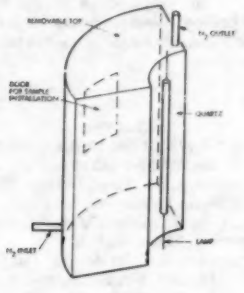
1. A particulate thermosetting adhesive composition having heat softening properties and the ability to resist penetration in a porous substrate, comprising individual free flowing finely divided discrete particles of substantially water insoluble inorganic particulate matter inert to and coated with a thermosetting resin comprising at least one aldehyde condensation product selected from the group consisting of phenol, resorcinol, melamine, urea, acetone, dicyandiamide, and mixtures thereof; and wherein the amount of particulate matter varies from about 1 to 240 parts by weight per 100 parts by weight of the solids content of the thermosetting resin.

4,945,001

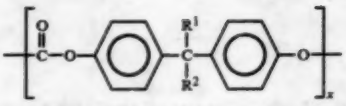
INTERNAL STABILIZATION OF POLYCARBONATE RESINS

Amitava Gupta, Pasadena; Ranty H. Liang, Arcadia, and Andre H. Yavrouian, La Crescenta, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 939,523, Dec. 8, 1986, Pat. No. 4,749,726, which is a continuation-in-part of Ser. No. 410,397, Aug. 23, 1982, abandoned. This application May 31, 1988, Ser. No. 200,246
Int. Cl.[5] C08J *3/28*; C08G *61/12, 63/46*
U.S. Cl. 428—412 3 Claims



1. A solid polycarbonate article having a bulk interior consisting essentially of a polycarbonate resin of the formula:



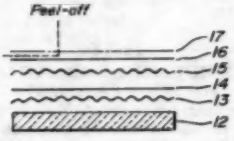
where x is the sum of n+m+m′ and said article having a surface layer of a stabilized polycarbonate resin of the formula: where n, m, and m′ are integers and R^1 and R^2 are individually selected from H, lower alkyl of 1 to 6 carbon atoms or aryl and m+m′ is 2 to 8 percent of n+m+m′ and m is at least 0.5 of m+m′.

4,945,002

IMPACT-RESISTING ANTI-LACERATIVE WINDOW UNITS

Itsuo Tanuma, Sayama; Hideo Takeichi, Tanashi; Masashi Segawa, Kodaira, and Toshio Honda, Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,290
Claims priority, application Japan, Aug. 28, 1986, 61-200008; Sep. 29, 1986, 61-228277
Int. Cl.[5] B32B *17/10*; C03C *27/12*
U.S. Cl. 428—425.6 4 Claims



1. An impact-resisting anti-lacerative window unit of a sandwich structure comprising two exterior plate-like members made of a transparent organic polymer (A) and a transparent organic polymer (B) or a glass plate, respectively, and multilayer structure intermediate films interposed between the exterior platelike members, wherein said films consist essentially of alternatively laminated ethylene-vinyl acetate and ethylene-vinyl acetate triallyl isocyanurate terpolymer layers having therebetween a layer of a high breaking strength material selected from the group consisting of polyethylene terephthalate, polyamides, aromatic polyamides, polyester polyethers, polysulfones and polyimides.

4,945,003

UV COATINGS CONTAINING CHLORINATED POLYOLEFINS, METHOD OF CURING, AND COATED SUBSTRATES THEREFROM

James E. Poole, Gibsonia, and Marvis E. Hartman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 168,069, Mar. 14, 1988, Pat. No. 4,880,849. This application Jul. 3, 1989, Ser. No. 374,799
Int. Cl.[5] B32B *15/08, 27/08, 27/32*
U.S. Cl. 428—462 7 Claims

1. A plastic substrate having directly adhered to a surface thereof, a crosslinked film from a coating composition containing:

(A) from 1 to 5 percent of a saturated, cholorinated polymeric material selected from the group consisting of (1) a chlorinated polyolefin containing about 5 to 75 percent by weight of chlorine and having a number average molecular weight of about 5,000–50,000, (2) a chlorinated polyolefin containing carboxylic anhydride groups and about 5 to 25 percent by weight of chlorine and having a number average molecular weight of about 5,000–50,000, and (3) a mixture thereof; (B) from 20 to 80 percent of a radiation

sensitive monomer having at least two addition polymerizable unsaturated bonds; (C) from 0.1 to 5.0 percent of a photopolymerization initiator; and (D) from 80 to 20 percent of an acrylic addition polymer having at least one amino group and having a number average molecular weight of about 8,000–70,000, said addition polymer being derived from a mixture of copolymerizable ethylenically unsaturated monomers containing a monomeric ethylenically unsaturated amine;

wherein said percentages of (A), (B), (C) and (D) are by weight based on nonvolatile components of said coating composition.

4,945,004

BASE MATERIAL FOR AN ALUMINUM OFFSET PRINTING PLATE

Gerhard Sprintschnik, Taunusstein; Walter Niederstaetter, Eltville; Kurt Reisa, Wiesbaden; Wolfgang V. Asten, Pulheim; Gunther Scharf, Boon, and Barbara Grzemba, Bonn, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main and Vereinigte-Aluminum Werke AG., Bonn, both of, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,152

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714059

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—469 **8 Claims**

1. A base material for aluminum offset printing sheets comprising an aluminum alloy consisting of from about 0.2 to about 0.6% by weight of iron, less than about 0.25% by weight silicon and copper combined, from about 0.1 to about 0.3% by weight manganese and the remainder being aluminum and trace production impurities, said base material further characterized as containing secondary precipitates in the form of phases of the Al Mn Si: Al Fe: Al Mn type which bear a ratio to one another of from about 1:1:2 to about 1:1:3, the mean particle size of said phases being from about 0.05 to about 0.10 micron with a maximum particle size of less than about 0.3 micron and further containing a precipitation structure with a degree of dispersion of less than about 50 phases per cubic micron.

4,945,005

THERMOPLASTIC COMPOSITIONS AND ARTICLES MADE THEREFROM

John F. Aleckner, Jr., Arlington; David J. Cherry, Grapevine, and Lee R. Spencer, Jr., Arlington, all of Tex., assignors to Dexter Corporation, Windsor Locks, Conn.

Continuation of Ser. No. 32,641, Mar. 31, 1987, abandoned. This application Jul. 28, 1989, Ser. No. 387,407

Int. Cl.[5] C08L *23/26, 23/04, 33/02;* **C08K** *3/00, 3/34*

U.S. Cl. 428—500 **27 Claims**

1. A thermoplastic composition comprising:

(a) about 2 to 25 weight percent of a copolymer having a melt index of between 0.5 and 1500 and derived from
  (i) about 70 to 95 weight percent of ethylene and
  (ii) about 5 to 30 weight percent of an ethylenically unsaturated carboxylic acid;

(b) about 3 to 50 weight percent of an elastomeric copolymer derived from
  (i) ethylene and
  (ii) a C_3 and C_{12} alpha-olefin;

(c) an amount up to about 55 weight percent of a crystalline polymer, said amount being sufficient to enable the thermoplastic composition to withstand an oven bake temperature of greater than 180° F., said polymer having a flow rate of up to about 30 and selected from one or more of the group consisting of
  (i) a homopolypropylene,
  (ii) a polypropylene onto which has been grafted up to about 12 weight percent of an ethylenically unsaturated carboxylic acid, and
  (iii) a copolymer of
    (1) propylene and
    (2) up to about 20 mole percent of a C_2 to C_{12} alpha-olefin;

(d) about 5 to 50 weight percent of an inorganic filler; and

(e) about 10 to 35 weight percent of a polymer having a melt index of between about 0.1 and 20 and selected from one or more of the group consisting of
  (i) homopolyethylene and
  (ii) a copolymer of
    (1) ethylene and
    (2) one or more of the group consisting of
      (A) a C_3 to C_{12} alpha-olefin,
      (B) a salt of an unsaturated carboxylic acid, and
      (C) an ester of an unsaturated carboxylic acid.

4,945,006

LOW ODOR ADHESIVE COMPOSITIONS AND BONDING METHOD EMPLOYING SAME

John M. Muggee, Stillwater, and Eric L. Zilley, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 17, 1989, Ser. No. 297,873

Int. Cl.[5] B32B *27/00*

U.S. Cl. 428—500 **20 Claims**

14. A process of bonding two or more substrates comprising the steps:

(a) applying to at least one of said substrates a coating comprising an adhesive composition comprising a mixture of:
  (1) at least one acrylamido compound selected from the group consisting of N-substituted acrylamides and methacrylamides that have a cyclic group directly attached to the amide nitrogen and acrylamides and methacrylamides in which the amide nitrogen is a member of a cyclic group;
  (2) at least one ethylenically-unsaturated acid that is copolymerizable with said acrylamido compound;
  (3) an effective amount of polymeric toughener; and
  (4) an effective amount of a free radical initiator; and

(b) applying to at least one of said substrates a coating comprising an activator composition;

(c) placing said coated substrates in an abutting relationship so as to form contact between said coatings, optionally under compressive pressure, until said adhesive composition polymerizes thereby bonding said substrates together.

4,945,007

BLANK OF MATERIAL IN SHEET FORM AND PARTITION MADE THEREFROM

Guy Coalier, Noce, and Jean-Claude Serre, Beaune, both of France, assignors to Embal-Systems, Paris, France

Filed Mar. 9, 1989, Ser. No. 321,753

Claims priority, application France, Mar. 10, 1988, 88 03125

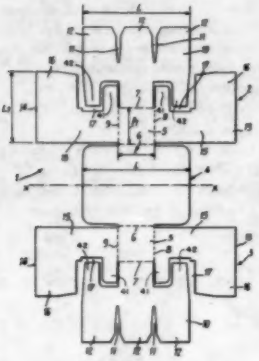
Int. Cl.[5] B65D *5/48*

U.S. Cl. 428—542.8 **8 Claims**

1. A one-piece blank made of a material in sheet form for producing a partitioning intended to subdivide a recipient container into a plurality of compartments, wherein said blank comprises:

two assemblies of articulated flaps which, by folding, are each capable of forming part of the compartments of said, partitioning; and

an approximately rectangular intermediate panel connected to the two assemblies of flaps respectively along a line



capable of being broken and along a line capable of serving as line of fold.

4,945,008

LAMINATED METAL SHEET

Peter J. Heyes, Wantage, and Nicholas J. Middleton, Highworth, both of England, assignors to CMB Packaging (UK) Limited, Worcester, England

PCT No. PCT/GB88/00856, § 371 Date Jun. 9, 1989, § 102(e) Date Jun. 9, 1989, PCT Pub. No. WO89/03307, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 12, 1988, Ser. No. 377,836

Claims priority, application United Kingdom, Oct. 15, 1987, 8724242

Int. Cl.[5] B29C *35/02*; B32B *1/10, 15/08*

U.S. Cl. 428—623 **32 Claims**

24. A container or a component for a container formed from a laminated metal sheet having adhered to one of its major surfaces a composite co-extruded polyolefin-containing film (B) comprising a plurality of layers in the following order:

(B1) an inner layer of a bonding resin which is an acid modified polyolefin resin containing carboxyl or anhydride groups,

(B2) a layer of a polyolefin,

(B3) a further layer of a bonding resin which is as defined for layer (B1), and

(B4) a layer of a polyamide.

4,945,009

ELECTROLUMINESCENCE DEVICE

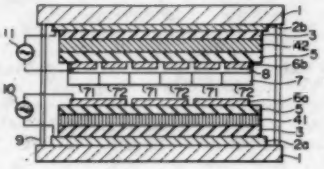
Kazuo Taguchi, Tokyo; Moriaki Fuyama, Hitachi; Kenichi Onisawa, Hitachi; Katsumi Tamura, Hitachi; Yoshimasa Ono, Mito; Yoshio Abe; Takahiro Nakayama, both of Hitachi; Akira Sato, Takahagi, and Kenichi Hashimoto, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,986

Claims priority, application Japan, Mar. 12, 1987, 62-57274

Int. Cl.[5] H05B *33/14, 33/22*

U.S. Cl. 428—690 **31 Claims**



1. An electroluminescence element comprising:

a structure, in which a first electrode, a first insulating layer, a light emitting layer, a second insulating layer and a second electrode are superposed one after another on a substrate; and

AC power sources connected between said first electrode and said second electrode;

wherein said light emitting layer comprises a bluish green light emitting sub-layer made of SrS as base material doped with Ce as activation material and a red light emitting sub-layer made of one selected from the group consisting of CaS as base material doped with Eu as activation material, ZnS as base material doped with Sm as activation material, and SrS as base material doped with Eu as activation material, said bluish green light emitting sub-layer being provided with a blue filter transmitting only blue light and a green filter transmitting only green light in the light emitted by said bluish green light emitting sub-layer, the brightness of the red, blue and green lights being substantially uniform, whereby three separate colors are transmitted from the red and bluish green light emitting sub-layers, and one of said AC power sources is for exciting said red light emitting layer and the other of said AC power sources is for exciting said bluish green light emitting layer.

4,945,010

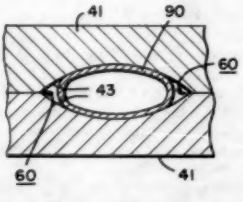
COOLING ASSEMBLY FOR FUEL CELLS

Arthur Kaufman, West Orange, and John Werth, Princeton, both of N.J., assignors to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 500,498, Jun. 2, 1983, abandoned. This application Aug. 13, 1986, Ser. No. 896,329

Int. Cl.[5] H07M *8/04*

U.S. Cl. 429—26 **7 Claims**



1. Cooling assembly for use in removing heat from a fuel cell

having means for circulating coolant through a cooling assembly adjacent the cell, the cooling assembly comprising:

(a) at least one comfortable coolant conduit means for carrying the coolant through the cooling assembly, and

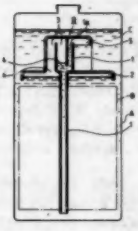
(b) means for holding the conduit means in the cooling assembly including at least one member which, when assembled with the conduit means, conforms at least a portion of the conduit means with its exterior surface in intimate contact with the interior surface of the member, the member including channel means therein to hold the coolant conduit means, the channel means shaped with its interior surface in a truncated half-circle contour so as to conform the coolant conduit means to the shape of the channel automatically when the member and coolant conduit means are assembled, the coolant conduit means comprising a non-corrodible, metal-free, dielectric material of a constant cross-sectional configuration in the area whereat it is held by the member.

4,945,011

STORAGE BATTERY PROVIDED WITH ELECTROLYTIC SOLUTION STIRRING DEVICE

Masafumi Tanaka, Kyoto, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Jul. 14, 1989, Ser. No. 379,769
Claims priority, application Japan, Jul. 20, 1988, 63-180982
Int. Cl.[5] H01M *2/38*
U.S. Cl. 429—81 **4 Claims**



1. A storage battery of the type having electrode plates immersed in an electrolytic solution; said battery being provided with an electrolytic solution stirring device comprising:

a vertically disposed solution-circulating tube positioned within said battery and being open at its upper and lower ends; said tube having a small hole therein at a middle portion thereof and a gas reservoir provided at said upper open end;

a gas-collecting chamber disposed above said plates and having a lower end opening below the level of said small hole; and

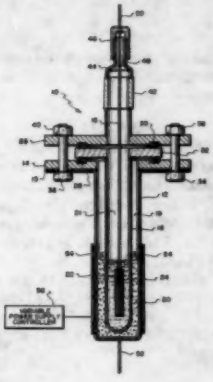
an inverted U-shaped siphon strap connected between said gas-collecting chamber and said small hole for communicating fluid between said gas chamber and said tube via said small hole.

4,945,012

COPPER CHLORIDE CATHODE FOR A SECONDARY BATTERY

Ratnakumar V. Bugga, Arcadia; Salvador Distefano, Alhambra; Ganesan Nagasubramanian, La Crescenta, and Clyde P. Bankston, Studio City, all of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 11, 1989, Ser. No. 405,169
Int. Cl.[5] H01M *6/20*
U.S. Cl. 429—103 **19 Claims**



1. A battery system comprising in combination:

a first body of liquid Group I metal anode;

a second liquid catholyte body comprising a metal salt molten at the temperature of operation of the battery, said molten salt including a Group I metal salt;

a solid ceramic separator disposed between said first and second bodies capable of conducting ions from the first body to the second body;

a first metal current collector in contact with said first body; and

a positive electrode comprising a solid porous body incorporating solid copper chloride in contact with said second body said copper chloride being insoluble in said molten metal salt.

4,945,013

CAPILLARY MIXING OF IMMISCIBLE LIQUIDS IN A BATTERY CELL

Hong S. Lim, Agoura, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 9, 1989, Ser. No. 295,094
Int. Cl.[5] H01M *10/39*
U.S. Cl. 429—104 **15 Claims**

1. A sodium sulfur electrical storage cell, comprising:

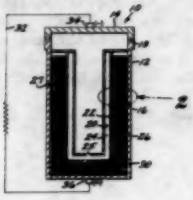
a sodium anode;

a sulfur cathode;

a solid ceramic electrolyte separating the sodium anode and the sulfur cathode;

means for conducting an electrical current from the cathode to an external electrical connection; and

means for circulating sulfur toward the electrolyte and moving reaction products away from the electrolyte through



the cathode during discharge of the cell, the means for circulating being operable in a weightless environment.

4,945,014

SECONDARY BATTERY

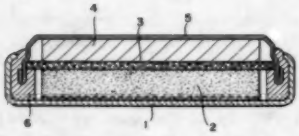
Mitsutaka Miyabayashi; Toshifumi Nishii; Hiroshi Yui, all of Yokkaichi; Kuniaki Inada, Tokyo; Katsuji Ikeda, Tokyo; Hiroyoshi Nose, Tokyo, and Kenji Tsuchiya, Tokyo, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Toshiba Battery Co., Ltd., both of Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,795

Claims priority, application Japan, Feb. 10, 1988, 63-27419; Apr. 5, 1988, 63-82256; Apr. 5, 1988, 63-82257; Oct. 31, 1988, 63-273146

Int. Cl.[5] H01M *4/38, 10/40*

U.S. Cl. 429—218 **21 Claims**



1. In a secondary battery having a negative electrode composed of an active substance and a carrier carrying said active substance, the improvement wherein

(1) said active substance is lithium or an alkali metal mainly composed of lithium,

(2) said carrier is a mixture composed of

(a) a carbonaceous material having

(i) an atomic ratio of hydrogen/carbon of less than 0.15 and

(ii) a spacing of (002) planes (d_{002}) as determined by X-ray wide angle diffraction of 3.37 Å or more and a crystallite size in the direction of c axis of 150 Å or less, and

(b) an alloy including said active substance and/or a metal capable of forming an alloy with said active substance.

4,945,015

INTUMESCENT MATERIAL

Bruce A. Milner, Sawston; Tessa Malcolm-Brown, Pampisford, and Eric Southern, Stevenage, all of England, assignors to Dixon International Limited, Pamisford, England

PCT No. PCT/GB87/00650, § 371 Date Mar. 13, 1989, § 102(e) Date Mar. 13, 1989, PCT Pub. No. WO88/02019, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 17, 1987, Ser. No. 340,297

Claims priority, application United Kingdom, Sep. 17, 1986, 8622341; Sep. 23, 1986, 8622823; Sep. 26, 1986, 8623157

Int. Cl.[5] C09K *21/14*

U.S. Cl. 523—179 **9 Claims**

1. A non-foamed intumescent material comprising: 40 to 70% by weight of a copolymer of vinyl acetate and ethylene as a flexible polymeric binder, and 15 to 60% by weight of expandable graphite, the percentages being based on the combined weight of said copolymer and said graphite.

4,945,016

ADHESIVE COMPOSITION

Tatsuya Murachi, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jan. 24, 1989, Ser. No. 300,899

Claims priority, application Japan, Mar. 25, 1988, 63-72417; Apr. 14, 1988, 63-92246; Apr. 27, 1988, 63-104897

Int. Cl.[5] C09G *18/42, 18/48;* C09J *175/06, 175/08*

U.S. Cl. 524—81 **6 Claims**

1. An adhesive composition comprising 100 parts by weight of a polyester-polyurethane having an isocyanate group (—NCO) and 0.002–20 parts by weight of a halogenating agent.

4,945,017

RUST CONVERSION COMPOSITION

Paul J. DesLauriers, Conroe, and William J. Hellman, Houston, both of Tex., assignors to Pennzoil Products Company, Houston, Tex.

Continuation of Ser. No. 884,175, Jul. 9, 1986, abandoned. This application Mar. 3, 1989, Ser. No. 320,842

Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—111 **15 Claims**

1. A rust conversion composition which consists essentially of the following reactants:

(a) a reducing agent which is compatible with the other reactants and will function to reduce trivalent iron to divalent iron;

(b) 20–50 wt % of an organic monomer or 70–80 wt % of an organic oligomer which is capable of polymerization in the presence of the reducing agent and ferric ions; and

(c) a stable free radical initiator which will function to polymerize the organic monomer wherein when said rust conversion composition is applied to a rusted surface in situ polymerization occurs which results in a durable coating.

4,945,018

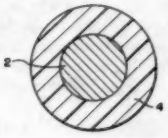
CROSSLINKABLE FLAME RETARDANT COMPOSITION OF POLYOLEFIN AND POLYPHENYLENE ETHER

Visvaldis Abolins, Delmar, N.Y.; Joseph E. Betts, Westport, Conn.; Fred F. Holub, Schenectady, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 888,561, Jul. 18, 1986, Pat. No. 4,808,647, which is a continuation of Ser. No. 525,782, Aug. 23, 1983, abandoned. This application Feb. 27, 1989, Ser. No. 316,247

Int. Cl.[5] C08K *5/521;* C08L *73/00*

U.S. Cl. 524—141 **51 Claims**

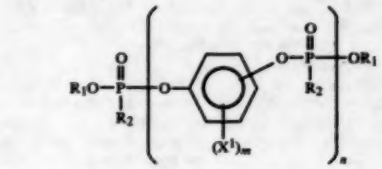


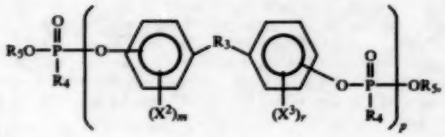
1. A heat or radiation curable flame retardant composition, comprising an admixture of

(a) at least 20 parts by weight of a non-rubbery crosslinkable

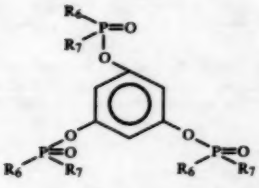
olefinic polymer based on 100 parts of the combined polymers in the composition;

(b) a flame retardant combination of (i) at least 5 parts of a polyphenylene ether resin based on 100 parts of (a) and (b)(i), (ii) an organic phosphate di- or polyfunctional compound or polymer having the formula





or



including mixtures thereof, wherein R_1, R_3, and R_5 are, independently, hydrocarbon; R_2, R_4, R_6 and R_7 are, independently, hydrocarbon or hydrocarbonoxy; X^1, X^2 and X^3 are halogen; m and r are 0 or integers from 1 to 4, and n and p are from 1 to 30, and (iii) a stable brominated material; and

(c) an effective amount of a crosslinking agent.

4,945,019

FRICTION WELDED BATTERY COMPONENT

Gerald K. Bowen, Cedarburg, and Jeffrey P. Zagrodnik, Hales Corner, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Sep. 20, 1988, Ser. No. 247,035

Int. Cl.[5] H01M 2/38

U.S. Cl. 429—72 **15 Claims**

1. A battery component for use in a flow battery containing fluid electrolyte, the battery component comprising:

first and second bond ribs disposed on opposite sides of and defining a channel; and

respective primary flash traps disposed adjacent said bond ribs opposite said channel.

4,945,020

PHOTOSENSITIVE LEUCO DYE CONTAINING ELECTROSTATIC MASTER WITH PRINTOUT IMAGE

Richard J. Kempf, Towanda, Pa.; Rolf Dessauer, Greenville, and Steven C. Freilich, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1989, Ser. No. 374,491

Int. Cl.[5] G03G 13/32; G03F 7/20

U.S. Cl. 430—49 **42 Claims**

1. A high resolution, photosensitive electrostatic master which upon imagewise exposure forms conductive exposed image areas, the master comprising an electrically conductive substrate bearing a layer of a photosensitive composition consisting essentially of

(A) at least one organic polymeric binder,

(B) a hexaarylbiimidazole photooxidant,

(C) a leuco dye that is oxidizable to an ionic species by the photooxidant,

(D) a nonionic halogenated compound, and

(E) a compatible plasticizer.

4,945,021

PHOTOSENSITIVE MEMBER COMPRISING BISAZO PIGMENT

Masakazu Takata; Takamasa Ueda; Kimiyuki Ito, all of Osaka; Yuko Mikasa, Nishinomiya; Yuki Shimada; Tsuneaki Hirashima, both of Osaka; Souichi Yamamoto, Himezi; Yoshio Ishino, Kyoto, and Toshinobu Ohno, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha and Osaka Municipal Government, both of Osaka, Japan

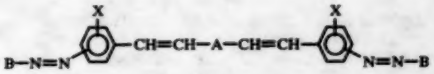
Filed Feb. 10, 1989, Ser. No. 308,629

Claims priority, application Japan, Feb. 16, 1988, 63-34593; May 25, 1988, 63-127495; Jul. 7, 1988, 63-169379; Oct. 27, 1988, 63-271899

Int. Cl.[5] G03G 5/06

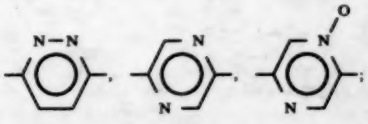
U.S. Cl. 430—76 **12 Claims**

1. A photosensitive member comprising a photoconductive layer incorporating a bisazo compound described by general structural formula [I] and formed on an electrically conductive substrate;

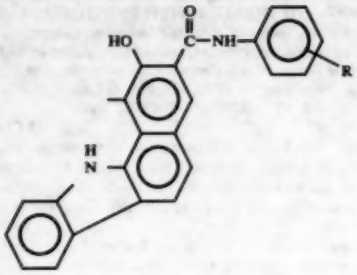


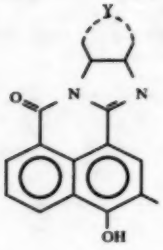
[I]

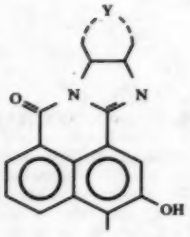
Wherein X is a hydrogen atom, halogen atom, alkyl radical, alkoxi radical, nitro radical or cyano radical; A is a diatomic radical selected from among the following:



B is a coupler described by formulae [II] through [IV];







R is a hydrogen atom, halogen atom, alkyl radical, alkoxi radical, nitro radical or cyano radical; and Y is an aromatic carbocyclic residue or aromatic heterocyclic residue, each of which may have a substituent.

4,945,022

TRIBOELECTRIC CHARGE APPLICATION MEMBER FOR TONER COMPRISING COPOLYMER OF FLUORO-OLEFIN MONOMER AND UNSATURATED SILICON MONOMER

Nobuhiro Nakayama, Susono; Yasuo Asahina, Numazu; Hiroyuki Fushimi, Numazu, and Yasuaki Iwamoto, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 163,694, Mar. 3, 1988, Pat. No. 4,841,331. This application Mar. 14, 1989, Ser. No. 323,359

Int. Cl.[5] G03G *9/08*

U.S. Cl. 430—120 **22 Claims**

1. A triboelectric charge application member for triboelectrically charging toner comprising a base substrate member and an overcoat layer formed thereon which layer comprises as the main component as copolymer prepared from at least one fluoro-olefin monomer and an unsaturated organosilane monomer.

4,945,023

[II] **LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND WHEREIN THE SILVER HALIDE IS MONODISPERSED**

Soichiro Yamamoto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,494

Claims priority, application Japan, Mar. 11, 1986, 61-55508

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] G03C *1/68, 1/72*

U.S. Cl. 430—138 **14 Claims**

1. A light-sensitive material comprising a support and a light-sensitive layer containing silver halide grains, a reducing agent, an ethylenically unsaturated polymerizable compound, wherein the silver halide grains and polymerizable compound

[III] are contained in microcapsules which are dispersed in the light-sensitive layer, said silver halide grains having such a grain size distribution that the coefficient or variation in terms of $\sigma/\bar{r}$ is not more than 20%, wherein σ means a standard deviation of the grain size and $\bar{r}$ means an average grain size, and said polymerizable compound being contained in microcapsules in an amount of 5 to 1.2×10^5 times by weight as much as the amount of the silver halide grains.

4,945,024

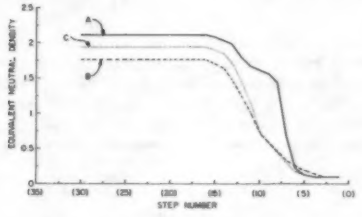
[IV] **METHOD FOR IMPROVING COLOR BALANCE IN IMAGING SYSTEMS EMPLOYING PHOTOSENSITIVE MICROCAPSULES**

Kerry Kovacs, Centerville, and Amy Burkholder, Kettering, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 10, 1988, Ser. No. 269,528

Int. Cl.[5] G03C *7/00, 1/68*

U.S. Cl. 430—138 **12 Claims**



1. A process for forming full color images using a photosensitive material which includes a support having a layer of photosensitive microcapsules on the surface thereof, said photosensitive microcapsules including a first, a second and a third set of microcapsules uniformly distributed on said surface; said first set of microcapsules containing a cyan image-forming agent and a first photohardenable composition sensitive in a first wavelength band, said second set of microcapsules containing a magenta image-forming agent and a second photohardenable composition sensitive in a second wavelength band, and said third set of microcapsules containing a yellow image-forming agent and a third photohardenable composition sensitive in a third wavelength band; said process comprising the steps of:

uniformly exposing said photosensitive material to radiation within at least one of said first, second, and third wavelength bands in an amount sufficient to sequester oxygen present in said microcapsules and thereby differentially adjust the gamma of at least one of said first, second and third sets of microcapsules such that it more closely approximates the gamma of the other of said microcapsules;

image-wise exposing said photosensitive material to radiation within said first, second and third wavelength bands; and

subjecting said microcapsules to a uniform rupturing force

to cause said microcapsules to rupture and release image-wise said cyan, magenta and yellow image-forming agents.

4,945,025

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND WHEREIN THE LIGHT-SENSITIVE LAYER IS PROVIDED WITH A COVER SHEET

Koichi Nakamura, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,481

Claims priority, application Japan, Mar. 11, 1986, 61-55507

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] G03C *1/68, 1/72*

U.S. Cl. 430—138 **18 Claims**

1. A light-sensitive material comprising a support and a light-sensitive layer containing silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound, said silver halide and said ethylenically unsaturated compound being contained in microcapsules which are dispersed in the light-sensitive layer, and said ethylenic unsaturated compound being contained in microcapsules in an amount of 5 to 1.2×10^5 times by weight as much as the amount of the silver halide, wherein the light-sensitive layer is provided thereon with a cover sheet.

4,945,026

IMAGE RECEIVING ELEMENT FOR USE IN A SILVER SALT DIFFUSION TRANSFER PROCESS

Hideki Tomiyama; Yukio Kurino, and Hiroshi Hayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 249,528, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 85,495, Aug. 14, 1987, abandoned. This application Oct. 2, 1989, Ser. No. 418,692

Claims priority, application Japan, Aug. 15, 1986, 61-191224; Aug. 15, 1986, 61-191225

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—233 **4 Claims**

1. A method for preparing an image receiving element for use in a silver salt diffusion transfer process, said method comprising:

(1) coating on a support in the recited order at least:

(a) an alkali neutralization layer,

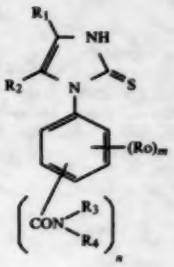
(b) a neutralization timing layer, and

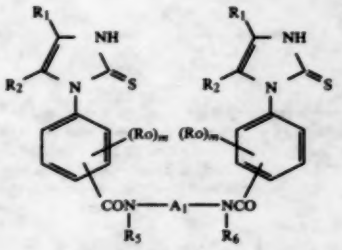
(c) an image receiving layer containing silver precipitation nucleus material, a cellulose ester and a substantially water free alkaline solution; and then

(2) saponifying said cellulose ester with said substantially water free alkaline solution to obtain said silver precipitation nucleus material in regenerated cellulose,

wherein said alkaline solution contains from 1 to 20% by weight of a polyhydric alcohol having two or more hydroxyl groups or a derivative thereof.

2. The method for preparing an image receiving element for use in a silver salt diffusion transfer process as claimed in claim 1, wherein at least one of the compounds represented by the following general formulae (I) or (II) is present in the neutralization layer and/or neutralization timing layer:





(II)

wherein Ro, which may be the same or different from each other, represents a hydrogen atom, a halogen atom, an alkyl group, a substituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted alkyl-sulfonyl group, a substituted or unsubstituted aryl-sulfonyl group, a sulfamoyl group, an alkyl- or aryl-sulfonamido group, a carbamoyl group, a carbonamido group, a substituted or unsubstituted heterocyclic group, a substituted or unsubstituted aryl group, an acyl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted acyloxy group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a primary amino group or a salt thereof, a secondary or tertiary amino group substituted with an alkyl or aryl group or a salt thereof, a nitro group, a hydroxy group, a carboxyl group, a sulfonic acid group or a cyano group;

R_1 and R_2 represent a hydrogen atom, an alkyl group, a substituted alkyl group or an aryl group;

R_3 and R_4 represent a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or a substituted or unsubstituted heterocyclic grup;

R_3 and R_4 may form together with the N atom a 5- to 6-membered ring in which a hetero atom may further be included;

R_5 and R_6 represent a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or a substituted or unsubstituted heterocyclic group;

A_1 represents a divalent group; m represents 0 or an integer of from 1 to 4; and n represents 0, 1 or 2.

4,945,027

1,4 OR 9,10 DIMETHOXYANTHRACENE TRIGGERS FOR 2-TRI(CHLORO OR BROMO)METHYL-4(1H)-QUINAZOLIMONE POLYMERIZATION INITIATORS

Wojciech A. Wilczak, Scotch Plains, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 23, 1987, Ser. No. 112,797

Int. Cl.[5] G03C *1/68*

U.S. Cl. 430—281 **19 Claims**

1. A polymerization initiator composition which comprises in admixture 1,4 or 9,10 dimethoxyanthracene and 2-tri(chloro

or bromo)methyl-4(1H)-quinazolinone in a respective weight ratio of from about 0.05:1 to about 1:1.

4,945,028

METHOD FOR FORMATION OF PATTERNS USING HIGH ENERGY BEAM

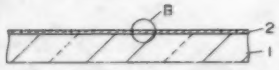
Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 61,541, Jun. 12, 1987, abandoned. This application Apr. 20, 1989, Ser. No. 341,257

Claims priority, application Japan, Jun. 12, 1986, 61-136512; Oct. 14, 1986, 61-243401

Int. Cl.[5] G03C 5/00

U.S. Cl. 430—296 10 Claims



1. A pattern forming method comprising the steps of:

preparing an energy-beam sensitive and hydrophobic film which comprises providing energy-beam sensitive molecules or polymers which contain energy-beam sensitive and hydrophobic groups which form hydrophilic groups when irradiated with said energy-beam, on the entire surface of a substrate;

selectively changing portions of the surface of said hydrophobic film to hydrophilic portions in a pattern-wise manner by selectively irradiating said film with said energy-beam;

selectively depositing an additional monomolecular film or an additional multi-monomolecular built-up film on said hydrophilic portions of the irradiated film by chemically adsorbing a silicion-containing reagent; and

performing a dry etching process using said additional monomolecular film on said additional multi-molecular built up film as a mask to form a thin film pattern.

4,945,029

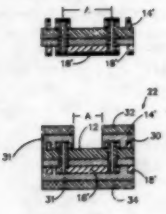
PROCESS FOR THE MANUFACTURE OF MULTI-LAYER CIRCUITS WITH DYNAMIC FLEXING REGIONS AND THE FLEXIBLE CIRCUITS MADE THEREFROM

David L. Bronnenberg, Riviera, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed May 6, 1988, Ser. No. 190,872

Int. Cl.[5] G03C 5/00

U.S. Cl. 430—316 9 Claims



1. A method of manufacturing a flexible circuit comprising the steps of:

providing an adhesiveless laminate comprising a first flexible non-conductive carrier film having a first conductive layer thereon;

providing a second conductive layer having a first layer of adhesive thereon;

laminating said first carrier film, first conductive layer, second conductive layer and first adhesive layer to define a flexible diclad laminate wherein said first carrier film and said adhesive layer are sandwiched between said first and second conductive layers;

forming at least two spaced conductive through holes in said diclad laminate with the area adjacent said through holes defining a bending region;

forming a first circuit pattern in said first conductive layer in a location outside of said bending region;

forming a second circuit pattern in said second conductive layer, said second circuit pattern being located in at least a portion of said bending region; and

removing the portion of said first conductive layer in said bending region to expose said first carrier film.

4,945,030

METHOD FOR DEVELOPING LITHOGRAPHIC PLATES COMPRISING A DEVELOPER COMPRISING ETHYLENE OXIDE/PROPYLENE OXIDE BLOCK COPOLYMERS

Gregory P. Turner, Belle Isle, and David S. Riley, Glidersome, both of England, assignors to Horsell Graphics Industries Limited, Leeds, England

Continuation of Ser. No. 124,838, Nov. 24, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 393,047

Claims priority, application United Kingdom, Nov. 29, 1986, 8628613

Int. Cl.[5] G03C 5/24, 5/34

U.S. Cl. 430—331 16 Claims

1. A method for developing lithographic printing plates, negative-acting and reversible lithographic printing plates comprising treating said plates with a developing fluid comprising between 12.5% and 17.5% by weight of an alkali and between about 0.01 and 10% by weight of an ethylene oxide/-propylene oxide block copolymer.

4,945,031

IMAGE-FORMING PROCESS COMPRISING BLEACHING AT LOW PH A MATERIAL COMPRISING A CYAN COUPLER AND HYDROQUINONE

Minoru Sakai; Osamu Takahashi, and Kozo Aoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

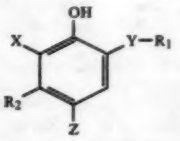
Filed Jun. 20, 1988, Ser. No. 208,904

Claims priority, application Japan, Jun. 19, 1987, 62-152744

Int. Cl.[5] G03C 5/38, 7/32, 7/34

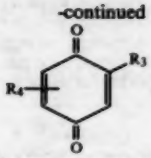
U.S. Cl. 430—393 18 Claims

1. An image-forming process, which comprises subjecting a multilayer silver halide photographic material containing, in an oil droplet dispersion in a light-sensitive layer provided on a support, at least one diffusion-resistant oil-soluble coupler capable of coupling with an oxidation product of an aromatic primary amine developing agent to form a substantially non-diffusible cyan dye represented by the following formula (I) and at least one member selected from the compounds represented by the following formulae (II) and (III), to imagewise exposure and color development, and then processing said multilayer silver halide photographic material with a bleaching or bleach-fixing solution having a pH of 6.3 or less:

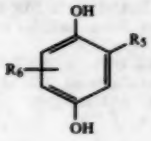


(I)

-continued



(II)



(III)

wherein:

Y represents —NHCO— or —CONH—;

R_1 represents an aliphatic group, an aromatic group, a heterocyclic group or an amine group;

X represents a hydrogen atom, a halogen atom, an aliphatic group, an alkoxy group or an acylamino group;

R_2 represents an alkyl group or an acylamino group or, when bound to X, non-metallic atoms forming a 5- to 7-membered ring;

Z represents a hydrogen atom or a group capable of being eliminated upon coupling with an oxidation product of a developing agent; and

R_3, R_4, R_5, and R_6 each represents a hydrogen atom, a straight chain, cyclic or branched alkyl or alkylthio group, provided that R_3 and R_4, or R_5 and R_6, do not represent hydrogen atoms at the same time and that at least one of R_5 and R_6 or at least one of R_5 and R_6 represents a branched or straight chain alkyl group having 8 to 20 carbon atoms and that, when they represent alkyl groups, those which are bound to the benzene ring via a tertiary carbon atom are excluded.

4,945,032

STEREOLITHOGRAPHY USING REPEATED EXPOSURES TO INCREASE STRENGTH AND REDUCE DISTORTION

Edward J. Murphy, Des Plaines; Robert E. Ansel, Hoffman Estates, and John J. Krajewski, Wheeling, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 176,240, Mar. 31, 1988, abandoned. This application Oct. 31, 1989, Ser. No. 429,561

Int. Cl.[5] B29B *13/08*; B29C *35/08*

U.S. Cl. 430—394 **6 Claims**

1. In a method for the formation of a thin walled three-dimensional object in a reservoir of liquid ultraviolet-curable ethylenically unsaturated material and in which a support is positioned immediately beneath the upper surface of the liquid reservoir with said upper surface being exposed to ultraviolet light in a pattern of line exposures to solidify the liquid at and near said upper surface in a series of cross-sections of the desired three-dimensional object, one atop the other, and thus form a series of superposed layers which adhere to one another to build said three-dimensional object within the liquid reservoir, the improvement comprising, stopping the line exposure at any portion of the surface in the formation of said series of superposed layers and then repeating the line exposure at least once again in the production of each said superposed layer so that the strength and solvent resistance of the formed object are increased and its distortion is minimized.

5. In a method for the formation of a three-dimensional object in a reservoir of liquid ultraviolet-curable ethylenically unsaturated material and in which a support is positioned immediately beneath the upper surface of the liquid reservoir with said upper surface being exposed to light effective to polymerize said ehtylenically unsaturated material in a pattern of line exposures to solidify the liquid at and near said upper surface in a series of cross-sections of the desired three-dimensional object, one atop the other, and thus form a series of superposed layers which adhere to one another to build said three-dimensional object within the liquid reservoir, the improvement comprising, stopping the line exposure at any portion of the surface in the formation of said series of superposed layers and then repeating the line exposure at least once again in the production of each said superposed layer so that the strength and solvent resistance of the formed object are increased and its distortion is minimized.

4,945,033

DIRECT POSITIVE PHOTOGRAPHIC MATERIALS

Naoyasu Deguchi, and Shigeru Ohno, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

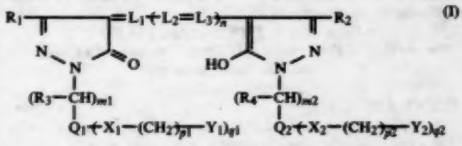
Filed Dec. 28, 1988, Ser. No. 291,017

Claims priority, application Japan, Dec. 28, 1987, 62-335568

Int. Cl.[5] G03C *1/84*

U.S. Cl. 430—522 **20 Claims**

1. A direct positive photographic material which has at least one previously-not-fogged internal latent image-type silver halide emulsion layer on a support, wherein said photographic material contains at least one compound represented by the following formula (I):



(I)

wherein each of R_1 and R_2 represents an alkyl group, an aryl group, a cyano group, —COOR5, —CONR5R6, —OR5, —NR5R6, —NR6SO2R7, where each of R_5 and R_6 represents a hydrogen atom, an alkyl group or an aryl group; R_7 represents an alkyl or aryl group; R_5 and R_6, or R_6 and R_7 may link together to form a 5- or 6-membered ring; each of R_3 and R_4 represents a hydrogen atom or an alkyl group; each of Q_1 and Q_2 represents an aryl group; each of X_1 and X_2 represents a bond or a divalent linking group; each of Y_1 and Y_2 represents a sulfo group or a carboxyl group; each of L_1, L_2 and L_3 represents a methine group; n represents 0, 1, or 2; each of m_1 and m_2 represents 1 or 2; each of p_1 and p_2 represents 0, 1, 2, 3 or 4; and each of q_1 and q_2 represents 1 or 2.

4,945,034

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masaki Tanji, and Toyoki Nishijima, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,612

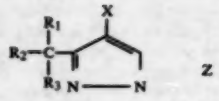
Claims priority, application Japan, Jan. 28, 1988, 63-18907

Int. Cl.[5] G03C *7/38*

U.S. Cl. 430—546 **13 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer containing silver halide grains having a silver chloride content of not less than 90 mol %, a compound represented by the following Formula I, and a quencher capable of deactivating the oxidized product of a color developing agent, said quencher having a relative reaction rate of not less than 1.6;

Formula I



wherein R1, R2 and R3, which may be the same as or different from each other represent a radical other than a hydrogen atom; Z represents a group of non-metal atoms necessary to complete a heterocyclic ring which may have a substituent; X represents a hydrogen atom or a group capable of being split off upon reaction with the oxidized product of a color developing agent;

wherein said relative rate is defined as relative reaction rate = DM/DM' wherein DM represents the density of a color image of coupler N when the quencher is not used; DM' represents the density of the color image of the coupler N when the quencher is added in a quantity of 1/10 mol per mol of coupler N.

10. The material of claim 1, wherein said silver halide emulsion layer contains a high-boiling organic solvent having a dielectric constant of less than 6.0.

4,945,035

PHOTOGRAPHIC EMULSIONS CONTAINING INTERNALLY MODIFIED SILVER HALIDE GRAINS

John E. Keevert, Jr.; Woodrow G. McDugle, and Raymond S. Eachus, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,377

The portion of the term of this patent subsequent to May 20, 2006, has been disclaimed.

Int. Cl.[5] G03C 1/06

U.S. Cl. 430—567 14 Claims

1. A photographic silver halide emulsion comprised of radiation sensitive silver halide grains containing greater than 50 mole percent chloride and less than 5 mole percent iodide, based on total silver, with any residual halide being bromide, said grains exhibiting a face centered cubic crystal lattice structure formed in the presence of a hexacoordination complex of rhenium, ruthenium, or osmium with at least four cyanide ligands.

4,945,036

SILVER HALIDE PHOTOSENSITIVE MATERIAL

Naoki Arai, and Kazuo Kagawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 31, 1989, Ser. No. 359,304

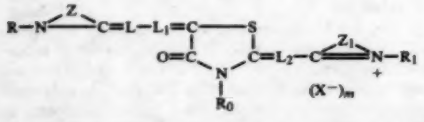
Claims priority, application Japan, May 31, 1988, 63-134096

Int. Cl.[5] G03C 1/18

U.S. Cl. 430—567 11 Claims

1. A silver halide photosensitive material comprising two or more monodisperse silver halide emulsions of different average grain size on a support, wherein at least one of said monodisperse silver halide emulsions has an average grain size of at least 0.7 μm, and at least one of the silver halide emulsions has a smaller average grain size than the other, the average grain size of the silver halide emulsion as a whole being within the range of from 0.33 to 0.54 μm, with a coated silver weight of from 2.3 to 3.8 g/m^2, and which contains a sensitizing dye represented by formula (I)

(I)



wherein Z and Z_1 each represents a group of non-metallic atoms forming a thiazole nucleus, a benzothiazole nucleus, or a benzoxazole nucleus; R_0 represents an alkyl group having from 1 to 6 carbon atoms, an allyl group, or an aralkyl group; R and R_1 each represents an alkyl group or an aryl group; L, L_1, and L_2 each represents a methine group; X represents an anion; and m represents 0 or 1, and an internal salt is formed when m is 0.

4,945,037

SILVER HALIDE PHOTOGRAPHIC EMULSION AND METHOD FOR MANUFACTURE THEREOF

Mitsuo Saitou, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 11, 1989, Ser. No. 336,406

Claims priority, application Japan, Apr. 11, 1988, 63-088376

Int. Cl.[5] G03C 1/02

U.S. Cl. 430—567 5 Claims

1. A method for the manufacture of a silver halide emulsion comprising silver halide grains, at least 60% of the total projected area of said silver halide grains being comprised of tabular silver halide grains having a central portion and an outer portion, of which the iodide content of the central portion is from 7 mol % to the solid solution limit, and which have two parallel twinned crystal planes, which comprises the steps of nucleating said silver halide grains under conditions where the gelatin concentration in the reaction solution is set at from 0.1 to 20 wt %, the addition rates of the silver salt and the halide are set at from 6×10^{-4} to 2.9×10^{-1} mol/minute per liter of reaction solution, and the pBr value in the reaction solution is set at from 1.0 to 2.5, Ostwald ripening the nucleated grains, and then growing the thus ripened grains.

4,945,038

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yasuhito Momoki; Takanori Hioki, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 138,185, Dec. 28, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 310,104

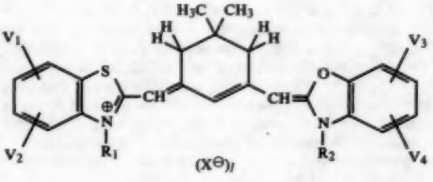
Claims priority, application Japan, Dec. 25, 1986, 61-314422

Int. Cl.[5] G03C 1/28

U.S. Cl. 430—576 11 Claims

1. A silver halide color photographic material comprising a support having provided thereon at least one silver halide emulsion layer, wherein said at least one silver halide emulsion layer comprises at least one compound represented by the formula (I) and at least one compound represented by the formula (II):

(I)



wherein

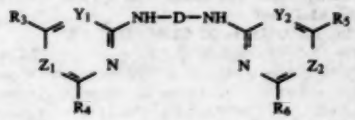
V_1, V_2, V_3 and V_4 each represents a hydrogen atom, a halogen atom, an alkyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a carboxy group, a cyano group, a hydroxy group, an amino group, an acylamino group, an alkoxy group or an

aryl group, or V_1 and V_2, or V_3 and V_4 may be bound to each other to form a benzene ring;

R_1 and R_2, which may be the same or different, each represents an alkyl group and may optionally form a salt with a metal atom or other organic compound;

$X^{\ominus}$ represents an anion; and

l represents 0 or 1 or, when the dye forms an inner salt, l represents 0;



(II)

wherein

D represents a divalent aromatic moiety;

R_3, R_4, R_5 and R_6 each represents a hydrogen atom, a hydroxy group, an alkoxy group, or an aryloxy group,

a heterocyclic group, a mercapto group, an alkylthio group, an arylthio group, a heterocyclylthio group, an amino group, an alkylamino gorup, a cyclohexylamino group, an arylamino group, a heterocyclylamino group, an aralkylamino group or an aryl group;

Y_1 and Y_2 each represents —N= or —CH=; and

Z_1 and Z_2 each represents —N= or —CH=;

further at least one of Y_1 and Z_1 is —N=, and at least one of Y_2 and Z_2 is —N=.

4,945,039

STANDARD MATERIALS FOR MEASUREMENT OF IMMUNE COMPLEXES AND METHOD FOR MEASUREMENT OF IMMUNE COMPLEXES

Hideaki Suzuki, Koganei; Kenji Hosoda, Kawagoe; Takaharu Kubota, Hino, and Yuji Fukumoto, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 711,134, Mar. 13, 1985, abandoned. This application Jun. 10, 1987, Ser. No. 60,957

Claims priority, application Japan, Mar. 13, 1984, 59-46422

Int. Cl.[5] G01N *33/564*

U.S. Cl. 435—7 **10 Claims**

1. A standard material for measuring immune complexes which is prepared by chemically binding immunoglobulin or its $F(ab')_2$ fragment or Fab' fragment from a non-immunized individual or FC fragment, with a substance selected from the group consisting of C1, C2, C3, C4, C5, C6, C7, C8, C9, C1q, C1v, C1s, C3c, C3d and Sh group containing derivatives of said C1, C2, C3, C4, C5, C6, C7, C8, or C9, through the medium of a bifunctional reagent.

4,945,040

IMMUNOASSAY FOR LIPOPROTEIN(A)

Gunther M. Fless, Hinsdale, and Angelo M. Scanu, Chicago, both of Ill., assignors to Arch Development Corporation, Chicago, Ill.

Filed Feb. 29, 1988, Ser. No. 162,000

Int. Cl.[5] G01N *33/92*

U.S. Cl. 435—7 **12 Claims**

1. A method for the detection and quantification of lipoprotein(a) in a fluid sample comprising:

forming a first immobilized complex of lipoprotein(a) present in said sample and an anti-apo(a) first antibody;

contacting said first immobilized complex with anti-apo B second antibody to form a second immobilized complex of anti-apo B second antibody/lipoprotein(a)/anti-human apo(a) first antibody; and

quantitating said bound lipoprotein(a) by quantitating the amount of said second immobilized complex formed.

4,945,041

MONOCLONAL ANTIBODIES FOR *MYCOPLASMA PNEUMONIAE* AND USE FOR DIAGNOSIS OF PNEUMONIA

Joel B. Baseman, San Antonio, Tex., assignor to Board of Regents

Continuation of Ser. No. 552,822, Nov. 17, 1983, abandoned. This application Jan. 9, 1987, Ser. No. 4,767

Int. Cl.[5] G01N *33/53*; C12N *5/00*; C12P *21/00*

U.S. Cl. 435—7 **11 Claims**

3. A method for the immunochemical diagnosis of *Mycoplasma pneumoniae* infection in a mammal using a monoclonal antibody comprising:

contacting body fluid from said mammal with a monoclonal specific for a non-immunodominant protein antigen of *Mycoplasma pneumoniae*;

measuring the amount of material immunologically bound by said monoclonal antibody; and

determining by comparing, for a positive diagnosis, whether the amount of bound material is greater than that found with body fluid from an uninfected mammal.

4,945,042

PROCESS AND REAGENT FOR THE DETERMINATION OF AN ANTIBODY

Thomas Geiger, Diessen, and Wolf D. Engel, Pähl, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,707

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1987, 3705686

Int. Cl.[5] G01N *33/535, 33/53, 33/563, 33/543*

U.S. Cl. 435—7 **10 Claims**

1. Process for the determination of an antibody comprising incubating an antibody containing sample with three different reagents R_1, R_2 and R_3, wherein R_1 and R_3 are in liquid phase and R_2 is found to a solid phase and binds to R_1 but not R_3, wherein R_1 comprises a conjugate of (i) a substance having at least one epitope specific for a parastope of an antibody to be determined and is specifically recognized by said antibody to be determined and (ii) a first reaction component of a two part, specific binding system, R_3 comprises a conjugate of (i) a substance having at least one epitope which binds to the same paratope of the antibody to be determined as does R_1 and is specifically recognized by said antibody to be determined and (ii) a label, wherein R_1 and R_3 compete for binding to the two identical paratopes of the antibody to be determined, and R_2 comprises a second reaction component of said two part, specific binding system, so as to bind R_1, complexes of R_1 and antibody, and conjugates of R_1, antibody and R_3 to said solid phase, separating liquid phase from said solid phase and measuring R_3 bound to said solid phase as a measure of antibody in said sample.

4,945,043

PROCESS AND REAGENT FOR THE DETERMINATION OF α-AMYLASE

Martin Gerber, Weilheim-Unterhausen, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed May 15, 1987, Ser. No. 50,887

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621271

Int. Cl.[5] C12Q *1/40*; G01N *33/53*

U.S. Cl. 435—7 **31 Claims**

1. Method for determining α-amylase in a sample comprising adding to said sample:

(i) an α-amylase substrate,

(ii) a monoclonal antibody which binds to α-amylase in the presence of all of the monoclonal antibodies produced by hybridoma cell lines NCACC 84111301, NCACC

84122003, NCACC 85022203 and ECACC 86060601 and which increases enzymatic activity of α-amylase, and

(iii) one or more auxiliary enzymes which act on a cleavage product formed by action of α-amylase on said α-amylase substrate, and measuring a cleavage product formed by action of said one or more auxiliary enzymes on the cleavage product formed by the action of α-amylase on its substrate as a measure of α-amylase in the sample.

4,945,044

OBJECTIVE BIOCHEMICAL METHOD FOR DETERMINING FERTILIZATION POTENTIAL IN OLIGOSPERMIC MEN

Gabor B. Huszar, 16 Chestnut La., Woodbridge, Conn. 06525

Filed Oct. 11, 1988, Ser. No. 255,510

Int. Cl.[5] C12Q *1/50*

U.S. Cl. 435—17 **13 Claims**

1. A method for testing sperm quality comprising the steps of:

(a) obtaining a sperm sample;

(b) detecting sperm CK enzyme from said sperm sample;

(c) measuring a CK enzyme concentration for CKX isoforms of said CK enzyme; and

(d) determining a sperm quality parameter based upon the CK enzyme concentration wherein an increased concentration of said CKX isoform indicates a higher chance of fertilization by said sperm sample.

4,945,045

ELECTROCHEMICAL METHODS OF ASSAY

Gordon C. Forrest, East Morsley; Simon J. Rattle, Quainton; Grenville A. Robinson, London, and Hugh A. O. Hill, Oxford, all of England, assignors to Serono Diagnostics Ltd., England

Continuation of Ser. No. 733,514, May 13, 1985, abandoned. This application Jun. 23, 1988, Ser. No. 212,043

Claims priority, application United Kingdom, Jul. 6, 1984, 8417301

Int. Cl.[5] C12Q *1/26*; G01N *27/26*

U.S. Cl. 435—25 **23 Claims**

1. In a homogeneous method of assaying a ligand in a sample using electrochemical apparatus containing a working electrode and components comprising:

(a) the sample, and

(b) a specific binding partner to the ligand, or a specific binding partner to the ligand and at least one further reagent selected from ligand analogues and specific binding partners to the ligand, the improvement which comprises said components including

(c) an electron-source or electron-acceptor selected from oxidoreductase enzymes in cooperation with a substrate therefor and non-enzyme electron sources;

one of components (b) being labelled with an electron-transfer mediator capable of aiding the transfer of electrons between the electron-source or electron-acceptor and the working electrode by accepting electrons from the electron-source and donating them to the working electrode, or accepting electrons from said electrode and donating them to the electron-acceptor; and

which method includes the step of determining whether the said transfer of electrons is perturbed by formation of a complex of said ligand with a specific binding partner.

4,945,046

YEAST PROMOTER AND PROCESS FOR PREPARING HETEROLOGOUS PROTEIN

Hajime Horii; Haruhide Kawabe; Hirofumi Arimura; Hiromichi Mukai; Kaoru Kobayashi; Muneo Tsujikawa, all of Osaka; Masayuki Nishida, and Tadakazu Suyama, both of Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jun. 3, 1987, Ser. No. 57,143

Claims priority, application Japan, Jun. 3, 1986, 61-127153; Sep. 26, 1986, 61-227441

Int. Cl.[5] C12P *21/00*; C12N *15/00, 5/00*

U.S. Cl. 435—69.3 **12 Claims**

1. A method of producing a heterologous protein in yeast which comprises transforming a yeast *Saccharomyces cerevisiae* with recombinant DNA comprising a hybrid promoter consisting essentially of *Saccharomyces cerevisiae* PHO5 or GAP-DH promoter from which the upstream activation site (UAS) has been deleted and replaced with the early enhancer region derived from SV40 virus and a gene coding for the heterologous protein, culturing the resulting transformed cells under conditions that permit expression of the gene coding for the heterologous protein, and isolating the heterologous protein from the culture medium.

4,945,047

MICROBIOLOGICAL PROCESS FOR THE PREPARATION OF A PROTEIN BY CULTURING A MUTANT BACTERIAL STRAIN

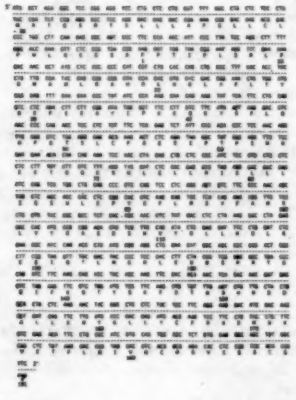
Richard Legoux, Caraman; Pascal Lepiatois, Cuq Toulza; Evelyne L. Joseph, Saint Orens De Gameville; Brigitte Niaudet, Toulouse, and Willem Roskam, Montgiscard, all of France, assignors to Societe Anonyme: Sanofi, Paris, France

Filed Apr. 9, 1987, Ser. No. 36,263

Claims priority, application France, Apr. 10, 1986, 86 05133

Int. Cl.[5] C12P *21/00*; C12N *15/00*; C12R *1/07, 1/185*

U.S. Cl. 435—69.4 **15 Claims**



1. A microbiological process for the preparation of a protein by culturing Gram-negative bacteria into which a DNA sequence coding for a precursor of this protein has been introduced, which comprises using a strain of bacteria whose chromosome carries at least one mutation affecting the system formed by the cya gene or the crp gene and the DNA sequences regulating expression of the cya gene or the crp gene, which mutation limits, or even suppresses, the expression of the operons whose transcription depends on the fixation of the cAMP-CRP complex, and wherein expression of the DNA sequence is not sensitive to the combined action of cAMP and CRP.

4,945,048

PROCESS FOR PRODUCING L-SORBOSE BY SUBCULTURE OF SEED

Yuji Uchihori; Yasushi Sekitani, and Ikuo Yoshida, all of Hikari, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed May 23, 1988, Ser. No. 197,404
Claims priority, application Japan, May 23, 1987, 62-126580
Int. Cl.[5] C12P *19/02*; C12R *1/01, 1/02*
U.S. Cl. 435—105 4 Claims

1. A process for producing L-sorbose which comprises culturing a L-sorbose-producing bacterium of the genus gloconobacter to obtain a seed culture and subjecting the seed culture to a main fermentation with a batchwise fermentation procedure, wherein a part of said seed culture is subjected to subculture to prepare a seed culture for a next batch, while carrying out the main fermentation with the remainder of said seed culture, and this procedure being repeated, successively.

4,945,049

METHOD FOR PREPARING MAGNETIC POWDER

Toru Hamaya, 1-D, Daiichiseifuso, 5-5, Minami 1-chome, Meguro-ku, Tokyo 152, and Koki Horikoshi, 39-8, Sakuradai 4-chome, Nerima-ku, Tokyo 176, both of Japan, assignors to Research Development Corporation; Toru Hamaya and Koki Horikoshi, all of Tokyo, Japan, a part interest

PCT No. PCT/JP88/00814, § 371 Date Apr. 14, 1989, § 102(e) Date Apr. 14, 1989, PCT Pub. No. WO89/01521, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 18, 1988, Ser. No. 343,263
Claims priority, application Japan, Aug. 18, 1987, 62-204815
Int. Cl.[5] C12P *3/00*
U.S. Cl. 435—168 16 Claims

1. A method for preparing at least one member selected from the group consisting of iron oxides, iron hydroxides and iron oxyhydroxides comprising: reacting an alkali-producing enzyme with a substrate of the enzyme in a solution containing iron ions to form an alkali substance, thereby alkalanizing the solution by the alkali substance; and obtaining fine particles of the iron compound having an average particle size ranging from about 50 to 500 nm.

4,945,050

METHOD FOR TRANSPORTING SUBSTANCES INTO LIVING CELLS AND TISSUES AND APPARATUS THEREFOR

John C. Sanford, Geneva; Edward D. Wolf, Ithaca, and Nelson K. Allen, Newfield, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,771
Int. Cl.[5] C12N *15/00, 15/89*
U.S. Cl. 435—172.1 22 Claims

1. A method for introducing particles into cells comprising accelerating particles having a diameter sufficiently small to penetrate and be retained in a preselected cell without killing the cell, and propelling said particles at said cells whereby said particles penetrate the surface of said cells and become incorporated into the interior of said cells.

4,945,051

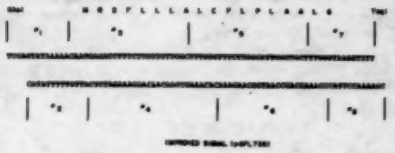
PRODUCTION OF HUMAN LYSOZYME

Masakazu Kikuchi, Toyono; Koji Yoshimura, Osaka, and Kazuo Nakahama, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 24, 1987, Ser. No. 65,860
Claims priority, application Japan, Jun. 30, 1986, 61-151809; Aug. 20, 1986, 61-192639; Feb. 23, 1987, 62-37869
Int. Cl.[5] C12N *15/00, 9/36, 1/16*; C07H *15/12*
U.S. Cl. 435—172.3 8 Claims

1. A purified and isolated DNA sequence for use in a yeast cell comprising a DNA segment coding for a signal peptide of the formula:

M-R-S-F-L-L-L-A-L-C-F-L-P-L-A-A-L-G



functionally linked to the 5' end of a DNA segment coding for human lysozyme.

4,945,052

PRODUCTION OF A VITAMIN C PRECURSOR USING GENETICALLY MODIFIED ORGANISMS

Kimber Hardy, Geneva, Switzerland; Hendrick van de Pol, Gif Sur Yvette, France; June Grindley, Alameda, Calif., and Mark A. Payton, Geneva, Switzerland, assignors to Biogen, Inc., Cambridge, Mass.

PCT No. PCT/US86/01571, § 371 Date Jun. 2, 1987, § 102(e) Date Jun. 2, 1987, PCT Pub. No. WO87/00863, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 1, 1986, Ser. No. 45,859
Claims priority, application United Kingdom, Aug. 2, 1985, 8519536
Int. Cl.[5] C12N *15/00*; C12P *21/00*; C07H *15/12*
U.S. Cl. 435—172.3 16 Claims

1. A DNA sequence coding for a 2,5-DKG reductase, said DNA sequence selected from the group consisting of:

(a) a synthetic or isolated DNA sequence of the formula:

CCGAACATCCCCACCATCAGCCTCAACGACGGACGC
CCCTTCGCCGAGCCTGGGCTCGGCACGTACAACCTG
CGCGGCGACGAGGGGGTCGCGGCCATGGTCGCCGCG
ATCGACTCGGGCTACCGCCTGCTCGACACGGCGGTG
AACTACGAGAACGAGAGCGAGGTCGGCCGAGCGGTG
CGCGCGAGCAGCGTCGATCGCGACGAGCTCATCGTG
GCGAGCAAGATCCCGGGCCGCCAGCACGGGCGCGCC
GAGGCGGTCGACAGCATCCGCGGATCGCTCGACCGG
CTGGGGCTCGACGTGATCGACCTGCAGCTGATCCAC
TGGCCGAACCCCAGCGTGGGCCGGTGGCTCGACACC
TGGCGCGGCATGATCGACGCGCGCGAGGCGGGCCTG
GTCCGCTCGATCGGCGTCTCGAACTTCACCGAGCCG
ATGCTGAAGACCCTCATCGACGAGACCGGGGTCACA
CCCGCGGTCAACCAGGTCGAGCTCCACCCGTACTTC
CCCCAGGCGGCGCTGCGCGCGTTCCACGACGAGCAC
GGCATCCGCACCGAGAGCTGGAGCCCGCTCGCCCGG
CGCAGCGAGCTGCTCACCGAGCAGCTGCTGCAGGAG
CTGGCGGTCGTCTACGGAGTGACGCCGACGCAGGTG
GTGCTGCGGTGGCACGTGCAGCTCGGCAGCACCCCG
ATCCCCAAGTCCGCCGACCCCGATCGCCAGCGCGAG
AACGCCGATGTGTTCGGCTTCGCCCTCACCGCCGAC
CAGGTCGATGCGATCTCGGGCCTCGAGCGCGGGCGG
CTCTGGGACGGCGACCCCGACACGCACGAAGAGATG;
and

(b) synthetic or isolated DNA sequences which, as a result of the degeneracy of the genetic code, code for a polypeptide encoded by the foregoing DNA sequence.

4,945,053

NOVEL ALKALINE CELLULASES AND A MICROORGANISM FOR PRODUCING THE SAME

Susumu Ito; Tomokazu Sato; Katsuya Ozaki; Shitsuw Saikata, all of Utsunomiya; Kikuhiko Okamoto, Koshigaya; Shigeo Inoue; Kenzo Koike, both of Utsunomiya; Yuichi Ota, and Akira Takei, both of Hasaki, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 110,774

Claims priority, application Japan, Oct. 28, 1986, 61-257775; Oct. 28, 1986, 61-257776; Oct. 28, 1986, 61-257777; Oct. 28, 1986, 61-257778

Int. Cl.[5] C12N 9/42; C12R 1/07

U.S. Cl. 435—209 8 Claims

8. A biologically pure strain of bacteria *Bacillis* species KSM-635 and variants thereof capable of producing an alkaline cellulase K, and having the following enzymatic properties:

(1) activity:
having Cx enzymatic activity, weak C_1 enzymatic activity and a weak beta-glucosidase activity;

(2) substrate specificity:
acting on carboxymethyl cellulose (CMC), crystalline cellulose, microcrystallline cellulose, cellobiose, and p-nitrophenyl cellobioside (PNPC);

(3) working pH and optimum pH:
having a working pH in the range of 4 to 12 and an optimum pH in the range of 9 to 10;

(4) pH stability:
being stable at a pH of 4.5 to 10.5 and 6.8 to 10 when allowed to stand at 40° C. for 10 minutes and 30 minutes, respectively;

(5) working temperature range and optimum working temperature;
working over a temperature range of from 10 to 65° C. with an optimum temperature at about 40° C.;

(6) influence of chelating agents:
having an activity not impeded by ethylenediamine tetraacetic acid, ethyleneglycol-bis-(beta-aminoethylether)-N,N,N',N''-tetraacetic acid, N,N-bis(carboxymethyl)glycine (nitrilotriacetic acid), sodium tripolyphosphoate and zeolite;

(7) influence of surface active agents:
losing little activity by sodium linear alkylbenzenesulfonates, sodium alkylsulfates, sodium polyoxyethylene alkyl sulfates, sodium alpha-olefin sulfonates, sodium alpha-sulfonated aliphatic acid esters, sodium alkyl sulfonates, polyoxyethylene secondary alkyl ethers, fatty acid salts (sodium salts), and dimethyldialkylammonium chloride;

(8) resistance to proteinases:
having a strong resistance to proteinases;

(9) molecular weight as determined by gel chromatography;
having a molecular weight of 180,000±10,000.

4,945,054

PROCESS FOR THE SEPARATION AND PURIFICATION OF PROTEASES AND ANTIPROTEASES OF BLOOD CLOTTING, AS WELL AS OF THE PROTEASE/ANTIPROTEASE COMPLEX

Christine Fougnot, Saint Denis; Marcel Jozefowicz, Lamorlaye, both of France, and Robert D. Rosenberg, Brookline, Mass., assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 17, 1983, Ser. No. 495,511

Claims priority, application France, May 19, 1982, 82 08779

Int. Cl.[5] C12N 9/74, 9/48

U.S. Cl. 435—214 12 Claims

1. A process for the separation and purification of a protein selected from the group consisting of thrombin (T), antithrombin (AT) and the complex thrombin-antithrombin (T-AT) from a solution which process consists essentially of

contacting an insoluble cross-linked polymer including in its chain at least one member of the group consisting of $—SO_3R_1—$ and $—SO_2R_2—$, in which R_1 hydrogen or a metal, and R_2 is an amino acid residue linked to the $—SO_2—$ bridge through its amine function —NH—, with a solution containing protein selected from the group consisting of (T), (AT) and (T-AT),

separating the polymer which has absorbed one of the said proteins from said solution,

washing the polymer on which desired protein is absorbed with a buffer,

desorbing (a) the absorbed protein (T) with a solution of a polycationic compound, or (b) the absorbed (AT) or (T-AT) with an albumin solution and isolating (T), (AT) or (T-AT), respectively.

4,945,055

HUMAN CHORIONIC GONADOTROPIN RELEASING FACTOR

Thomas J. Kuehl; M. J. K. Harper; Gabriel S. Khodr, and Theresa M. Siler-Khodr, all of San Antonio, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed May 15, 1986, Ser. No. 863,310

Int. Cl.[5] C12N 9/64

U.S. Cl. 435—226 12 Claims

8. A method for the preparation of a 4,000- fold purified human placental hCG-RF protein from human placental tissue, comprising the steps of:

(a) obtaining an amount of human placental tissue;

(b) dissecting membranes and vessels from the placental tissue to form processed human placental tissue;

(c) lyophilizing the processed placental tissue to form lyophilized human placental tissue;

(d) defatting the lyophilized human placental tissue with acetone and collecting an acetone precipitate;

(e) extracting hCG-RF from the placental acetone precipitate with an aqueous buffer having a pH of about 7.0 to about 9.0 form a placental suspension;

(f) collecting a placental supernatant from the placental suspension;

(g) collecting a placental eluate from the placental supernatant through a chromatography column;

(h) dialyzing and concentrating the human placental eluate to form a concentrated human placental eluate;

(i) applying the concentrated human placental eluate to a diethylaminoethyl ion exchange filtration dextran bead column;

(j) washing the column with a NaCl buffer to collect a purified humand placental eluate; and

(k) concentrating the purified human placental eluate to form a 4,000-fold purified preparation of human placental hCG-RF protein.

4,945,056

L60: A NOVEL MONOCLONAL ANTIBODY

David W. Buck, Granada, and Jane M. Bindl, Los Altos, both of Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 30, 1987, Ser. No. 139,491

Int. Cl.[5] G12N 5/00, 15/00; C12R 1/91; A61K 39/00

U.S. Cl. 435—240.27 2 Claims

1. A hydridoma deposited as ATCC number HB-9575.

4,945,057

MONOCLONAL ANTIBODIES TO CRYSTAL PROTEIN OF *BACILLUS THURINGIENSIS* SUBSPECIES *ISRAELENSIS*

Kevin B. Temeyer, San Antonio; Maurice Haufler, and John H. Pruett, both of Kerrville, all of Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 18, 1987, Ser. No. 50,451
Int. Cl.[5] C12N *5/20*; C07K *15/28*
U.S. Cl. 435—240.27 2 Claims

1. The hybridoma ATCC HB 9362 or a subclone thereof which produces and secretes monoclonal antibody that specifically binds to the 68K crystal protein of *Bacillus thuringiensis* subsp. *israelensis*.

2. Monoclonal antibody produced by the hybridoma of claim 1.

4,945,058

PLASMID WITH WIDE HOST RANGE AND PROCESS OF PRODUCING L. THREONINE USING THE SAME

Akira Yanai, 4-21, 2-chome, Tsunishi, Kamakura, Japan (248), and Yoshizumi Ueda, 81-K, 1-Chome, Ikegamidai, Midori-ku, Nagoya, Japan (458)

Filed Oct. 17, 1986, Ser. No. 919,993
Claims priority, application Japan, Oct. 18, 1985, 60-230993; Oct. 18, 1985, 60-230996
Int. Cl.[5] C12N *1/20, 15/00*; C12P *13/08*
U.S. Cl. 435—252.3 11 Claims

1. A wide host range plasmid pYU300 extracted from a microorganism belonging to the genus Providencia which can replicate in a second genus belonging to the family Enterobacteriaceae.

4,945,059

METHOD OF PROLIFERATING VESICULAR-ARBUSCULAR MYCORRHIZAL FUNGI

Mitsuyoshi Okli, Ami, and Shunichi Ishijima, Miho, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 104,396
Claims priority, application Japan, Oct. 2, 1986, 61-235406
Int. Cl.[5] C12P *1/02*; C12N *1/14*; C12R *1/645*
U.S. Cl. 435—254 4 Claims

1. A method of proliferating vesicular arbuscular mycorrhizal fungi (VAM fungi) which comprises inoculating VAM fungi selected from fungi belonging to the genus Gigaspora, Glomus, Sclerocystis, Entrophospora or Acaulospora in a soil medium containing a potato and a porous amphoteric ion exchanger selected from the group consisting of Adelite, DEAE-CPG and DEAE-Cellulofine adsorbed by a VAM fungi growth accelerator selected from the group consisting of organic acids, amino acids and vitamins and/or a VAM formation accelerator selected from the group consisting of ethylene generators and auxins, and growing a potato in the soil medium.

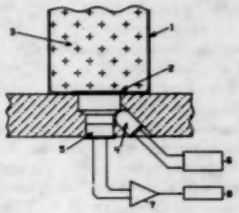
4,945,060

DEVICE FOR DETECTING MICROORGANISMS

James E. Turner, Chapel Hill; Thurman C. Thorpe, Durham; James L. Di Guiseppi, Chapel Hill, and Richard C. Driscoll, Raleigh, all of N.C., assignors to Akzo N. V., Arnhem, Netherlands

Filed Mar. 15, 1988, Ser. No. 168,291
Int. Cl.[5] C12M *1/34*
U.S. Cl. 435—291 7 Claims

1. A device for continuously monitoring biological activity in a specimen comprising a sealable, sterilizable, specimen container, having an internal chamber in which a specimen may be cultured with a sterile culture medium, having at least one transparent section in said container and a sensor means located inside said container in the region of the transparent section, whereby changes in the appearance of the sensor means can be continuously monitored from the exterior of said container through said transparent section, thereby monitoring biological activity without violating the integrity of said container after sealing, said sensor means comprising a membrane



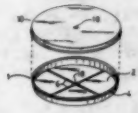
and a non-fluorescent indicator medium, the indicator medium being selected for its ability to exhibit a detectable change when exposed to products of an organism's metabolic activity, wherein the sensor is sterilizable by heating without affecting its function.

4,945,061

DISPOSABLE CULTURE DISH WITH REINFORCEMENT RIBS

Ezzat Iskander, 36 George Crescent, Caledon East, Ontario, Canada L0N 1E0

Filed Nov. 27, 1989, Ser. No. 441,530
Int. Cl.[5] C12M *3/00*
U.S. Cl. 435—298 19 Claims



1. In a Petri dish having a substantially flat horizontal bottom portion and a short substantially cylindrical side wall integral with and around said bottom portion, the improvement in which said bottom portion is provided with a plurality of upwardly projecting ribs, the upwardly projecting portions of said ribs, projecting not more than about 0.050 inches above the upper surface of said bottom, and in which the thickness of said bottom portion other than at the ribs is not greater than about 0.030 inches.

4,945,062

CONTROL FOR BLOOD GAS/CALCIUM ANALYSIS INSTRUMENTATION

Ching Chiang, Acton, Mass., assignor to Bionostics Incorporated, Acton, Mass.

Filed Jun. 15, 1988, Ser. No. 207,182
Int. Cl.[5] G01N *31/00*
U.S. Cl. 436—11 17 Claims

16. An autoclavable, stable, homogeneous liquid control standard for blood analysis instrumentation systems comprising an aqueous solution containing a buffering agent in an amount sufficient to maintain the control standard pH in a

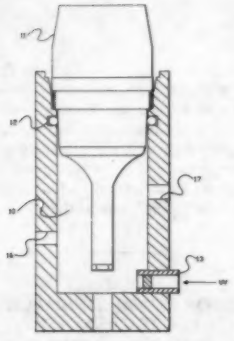
range of from about 7.1 to about 7.7 and additionally containing sufficient bicarbonate ion to provide a pCO_2 ranging from about 15 mmHg to about 80 mmHg, gaseous oxygen to provide a pO_2 ranging from about 15 mmHg to about 400 mmHg retained, a calcium salt to provide a total calcium concentration in a range of between about 1.3 mM and about 3.6 mM, a citric acid calcium sequestering solution to provide an ionized calcium concentration ranging from about 0.5 mM to about 1.7 mM, wherein the concentration ratio of ionized calcium to total calcium is in a range of about 30% to about 60%, salts of sodium, potassium and lithium to provide an electrolyte concentration in the range of physiological sodium, potassium and lithium electrolyte concentration, and absorbance means corresponding to a predetermined level of hemoglobin and hemoglobin fractions, said absorbance means comprising dyes selected from the group consisting of Acid Red Dye #27 (CI 16185), Ponceau 3R Red Dye (CI 16155), Acid Yellow Dye #23 (CI 19140) and Acid Blue Dye #9 (CI 42090).

4,945,063

METHOD FOR DETECTING ORGANIC COMPOUNDS BY PHOTOACOUSTIC CONVERSION

Madeline S. Toy, 4190 Manuela Ave., Palo Alto, Calif. 94306, and Melvin K. Carter, 129 Worcester Loop, Los Gatos, Calif. 95032

Filed Sep. 22, 1988, Ser. No. 247,710
Int. Cl.[5] G01N *33/44*; B01J *19/08, 19/10*
U.S. Cl. 436—85 11 Claims



1. A method for detecting residues of organic resins in an aqueous sample comprising the steps of simultaneously exposing said aqueous sample suspected of containing said resins to ultraviolet radiation and acoustic energy to decompose said organic resins to simple decomposition products, and analyzing said sample to detect at least one of said simple decomposition products, if present.

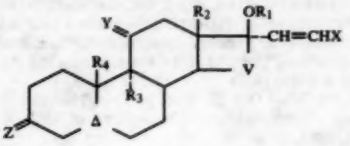
4,945,064

ESTRANE AND ANDROSTANE DERIVATIVES, PROCESS FOR PRODUCING THEM AND PREPARATIONS CONTAINING THESE COMPOUNDS

Helmut Hofmeister; Henry Laurent; Paul E. Schulze, all of Berlin; Klaus Annen, Muenster-Albachten; Rudolf Wiechert, Berlin; Kunhard Pollow, Mainz-Hechtsheim; Bernhard Manz, Mainz-Bretzenheim, and Hans-Joerg Grill, Mainz, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 737,242, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 659,581, Oct. 10, 1984, abandoned. This application Jan. 19, 1988, Ser. No. 147,580
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1983, 3337179
Int. Cl.[5] G01N *33/566, 33/567*; C07J *1/00, 3/00*
U.S. Cl. 436—503 38 Claims

1. An estrane of the formula



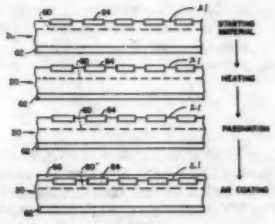
wherein
X is bromo, iodo, triphenyltin or tri-(C_{1-4})alkyltin;
Y is two hydrogen atoms or methylene;
Z is two hydrogen atoms or oxo;
V is vinylene, cyclopropylene or 1,3-propylene;
R_1 is H, a C_{1-8}-hydrocarbon radical, or a C_{1-8}-hydrocarbon radical interrupted by an oxa atom or substitued by oxo;
R_2 is methyl or ethyl;
R_3 and R_4 together form a carbon-carbon bond, or R_3 is H and R_4 is H or methyl; and
Δ symbolizes a 4(5) double bond.

4,945,065

METHOD OF PASSIVATING CRYSTALLINE SUBSTRATES

James A. Gregory, Sudbury; Jack I. Hanoka, and Zinovy Y. Vayman, both of Brookline, all of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed Jun. 2, 1988, Ser. No. 201,559
Int. Cl.[5] H01L *21/223, 21/322, 31/18*
U.S. Cl. 437—4 6 Claims



1. A method of fabricating a solar cell comprising in sequence the steps of:
(a) providing a polycrystalline silicon substrate having a p/n junction formed therein adjacent one side of the substrate, said substrate having an electrode grid on one side and an aluminum layer on the other side thereof, further wherein said one side is not coated with a layer of silicon nitride or phosphorus glass;
(b) exposing said one side of the substrate to an SiF_4 ion

beam of an intensity and for a duration sufficient to bulk passivate said substrate; and

(c) applying an antireflection coating to said one side of said substrate.

4,945,066

PROCESS FOR MANUFACTURING A DYNAMIC RANDOM ACCESS MEMORY CELL

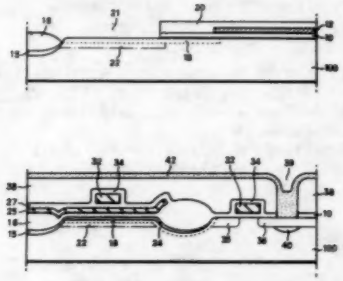
Myong-Ku Kang, Seoul; Byong-Hyun Park, Kyoungsangbuk, and Won-Hee Jang, Seoul, all of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Rep. of Korea

Filed Feb. 23, 1988, Ser. No. 159,177

Claims priority, application Rep. of Korea, Feb. 24, 1987, 1987-1554

Int. Cl.[5] H01L *27/108, 21/265*

U.S. Cl. 437—30 **19 Claims**



1. A process for manufacturing a dynamic random access memory cell, comprising the sequential steps of:

(1) forming a first oxide layer and a silicon nitride layer over a surface of silicon substrate and ion implanting boron for forming a channel stopping region;

(2) forming a field oxide layer for isolating each cell over said channel stopping region;

(3) ion implanting phosphorus for forming a coupling region connecting a lower electrode of a storage capacitor with a source region of a transistor;

(4) etching an edge part of said field oxide layer just around a perimeter of said storage capacitor with a diluted solution of hydrofluoric acid to increase capacitance of said storage capacitor by enlarging an area of the storage capacitor, and ion implanting boron for forming a first barrier to prevent a collection of minority carriers resulting from alpha particles under the storage capacitor;

(5) growing a second oxide layer over an etched area of the storage capacitor and ion implanting arsenic for forming said lower electrode of the storage capacitor;

(6) forming a first polysilicon layer over said second oxide layer to serve as a second electrode of said storage capacitor;

(7) forming a thick oxide layer over said first polysilicon layer and, after removing all remaining of said silicon nitride layer, doping impurities in all the surface of the substrate in order to control threshold voltage;

(8) forming a second polysilicon layer to serve as a gate electrode of the transistor and a word line over the first oxide layer, and forming a source and drain region of the transistor;

(9) forming an interlayer of oxide over the substrate, forming a window for coupling a bit line to the drain of said transistor and then ion implanting boron through said window to form a second barrier against minority carriers below the drain region of the transistor; and

(10) forming the bit line over said interlayer.

4,945,067

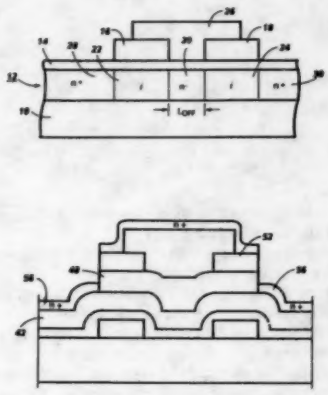
INTRA-GATE OFFSET HIGH VOLTAGE THIN FILM TRANSISTOR WITH MISALIGNMENT IMMUNITY AND METHOD OF ITS FABRICATION

Tiao-Yuan Huang, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 245,872, Sep. 16, 1988, Pat. No. 4,907,041. This application Nov. 2, 1989, Ser. No. 430,850

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—41 **3 Claims**



1. A process for forming a high voltage thin film transistor comprising the steps of

depositing an intrinsic non-single crystal semiconductor layer upon a dielectric substrate,

depositing a gate dielectric layer over said intrinsic semiconductor layer,

depositing a conductive layer over said gate dielectric layer,

patterning said conductive layer with a single mask to form a pair of gate electrodes with a precise distance therebetween,

implanting lightly doped regions in said semiconductor layer, using said gate electrodes as an implantation mask, so as to dope those regions of said semiconductor layer outboard of and between said gate electrodes,

depositing a roughly aligned mask upon said gate electrodes for blocking said inter-gate distance, and

implanting heavily doped source and drain regions in said semiconductor layer in those regions outboard of said gate electrodes.

2. A process for forming a high voltage thin film transistor comprising the steps of

patterning a pair of spaced gate electrodes upon a substrate with a single mask,

sequentially depositing a gate dielectric layer, an intrinsic non-single crystal semiconductor layer, and a passivation layer on said substrate, over said gates,

forming a pair of masking members upon said semiconductor layer in alignment with said gate electrodes,

depositing a rough mask upon and between said pair of masking members,

etching said passivation layer outboard of and in alignment with said pair of masking members,

depositing a heavily doped non-single crystal semiconductor layer, and

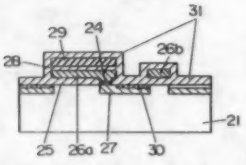
lifting off said pair of masking members and said rough mask along with the portion of said heavily doped non-single crystal semiconductor layer overlying said masking members and said rough mask.

4,945,068

MANUFACTURING METHOD OF SEMICONDUCTOR NONVOLATILE MEMORY DEVICE

Tadashi Sugaya, Nara, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Oct. 25, 1989, Ser. No. 426,230
Claims priority, application Japan, Oct. 25, 1988, 63-267041
Int. Cl.[5] H01L *27/115*
U.S. Cl. 437—52 **4 Claims**



1. A manufacturing method of semiconductor nonvolatile memory device comprising:

a step of forming a mask on the surface of a silicon substrate, and patterning said mask,

a step of injecting nitrogen ions into the surface of said silicon substrate from above said mask,

a step of removing said mask, 'a step of forming oxide films on the surface of said silicon substrate by simultaneously oxidizing the nitrogen ion injection region and the injection-free region of said silicon substrate surface, thereby forming an ultrathin tunnel oxide film on said nitrogen ion injection region and a thick first gate oxide film on said injection-free region of said silicon substrate surface respectively,

a step of depositing a first semiconductor thin film on the surface of said tunnel oxide film and said first gate oxide film,

a step of forming a first gate in a shape of covering at least said nitrogen ion injection region by patterning said first semiconductor thin film,

a step of forming an insulating film on the surface of said first gate,

a step of depositing a second semiconductor thin film on the surface of said insulating film, and

a step of forming a second gate overlapping with said first gate and said insulating film, by patterning said second semiconductor thin film.

4,945,069

ORGANIC SPACE HOLDER FOR TRENCH PROCESSING

Duane E. Carter, Plano, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Dec. 16, 1988, Ser. No. 285,910
Int. Cl.[5] H01L *21/312, 21/336*
U.S. Cl. 437—67 **16 Claims**

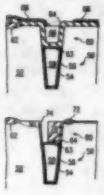
12. A method for fabrication of a device, comprising the steps of:

providing a substrate with a cavity formed therein;

filling said cavity with a first material;

forming an etch mask partially covering said first material;

etching said first material where not protected by said etch mask;



filling the portion of said first material removed by said etching with a second material; and

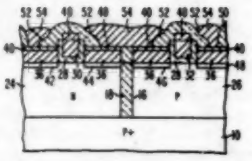
removing the remainder of said first material.

4,945,070

METHOD OF MAKING CMOS WITH SHALLOW SOURCE AND DRAIN JUNCTIONS

Sheng T. Hsu, Lawrenceville, N.J., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 24, 1989, Ser. No. 301,073
Int. Cl.[5] H01L *21/235*
U.S. Cl. 437—160 **15 Claims**



1. A method of making a MOS transistor having shallow source and drain regions in a body of single crystalline silicon of one conductivity type having a major surface comprising the steps of:

forming a thin layer of silicon oxide on a portion of the major surface of the body;

forming a gate line of a conductive material on the silicon oxide layer;

then forming on the major surface of the silicon body on each side of the gate line a layer of polycrystalline silicon having a region of a refractory metal silicide extending at least through a portion thereof;

then doping the silicide region with a conductivity modifier of a conductivity type opposite to that of the silicon body; and

then heating the body to diffuse the conductivity modifier through the polycrystalline silicon layer into the silicon body to form the shallow source and drain regions of the transistor.

4,945,071

LOW SOFTENING POINT METALLIC OXIDE GLASSES SUITABLE FOR USE IN ELECTRONIC APPLICATIONS

G. Delbert Friesen, Hunt. Beach; Yun K. Shin, Glendale, both of Calif., and Lewis Hoffman, deceased, late of Riviera Beach, Fla. (by Norma Hoffman, Executrix), assignors to National Starch and Chemical Investment Holding Company, Wilmington, Del.

Filed Apr. 19, 1989, Ser. No. 340,183
Int. Cl.[5] C03C *3/12*
U.S. Cl. 501—41 **13 Claims**

1. A low softening point glass composition comprising 2 to

40% by wt. silver oxide, 12 to 40% by wt. vanadium oxide, and 35 to 75% by wt. tellurium oxide, and 2 to 30% by wt. lead oxide, wherein all percentages total 100.

4,945,072

PRECERAMIC METALLOPOLYSILANES

Gary T. Burns, and Gregg A. Zank, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 264,561, Oct. 31, 1988, Pat. No. 4,906,710. This application Dec. 11, 1989, Ser. No. 457,120

Int. Cl.[5] C04B 35/56

U.S. Cl. 501—88 15 Claims

1. A method for preparing a ceramic material which method consists of heating a metallopolysilane in an inert atmosphere, in a vacuum, or in an ammonia atmosphere to a temperature of at least 750° C. until the metallopolysilane is converted to a ceramic material, where the metallopolysilane is prepared by a method which comprises (A) contacting a polysilane with a metallic compound capable of generating open coordination sites where the metallic compound contains a metal selected from the group consisting of aluminum, boron, chromium, molybdenum, tungsten, titanium, zirconium, hafnium, vanadium niobium, and tantalum and (B) forming open coordination sites of the metallic comPound, in the presence of the polysilane, until a metallopolysilane is obtained.

4,945,073

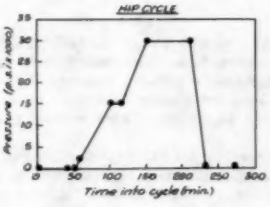
HIGH HARDNESS, WEAR RESISTANT MATERIALS

Ellen M. Dubensky, and Edward E. Timm, both of Traverse City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 247,054, Sep. 20, 1988. This application Sep. 1, 1989, Ser. No. 403,209

Int. Cl.[5] C04B 35/56

U.S. Cl. 501—93 13 Claims



1. A material suitable for use in fabricating articles of manufacture requiring high degrees of hardness or wear resistance, the material consisting essentially of a substantially fully dense, complex, multi-phase, fine-grained product of an in complete reaction between AX and a source of B, the reaction taking place under pressure and at an elevated temperature, said product consisting essentially of at least one compound AX and at least one compound (A,B)X wherein A and B are different materials selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten and X is carbon.

4,945,074

POLYMERIC ALKALI METAL SILICATE GLASS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Continuation of Ser. No. 339,667, Apr. 18, 1989, Pat. No. 4,908,339, which is a continuation-in-part of Ser. No. 057,810, Jun. 1, 1987, Pat. No. 4,824,807. This application May 1, 1989, Ser. No. 345,841

Int. Cl.[5] C03C 3/04

U.S. Cl. 501—53 17 Claims

1. A polymeric alkali metal silicate glass produced by contacting alkali metal silicate glass powder, having a silicon dioxide: alkali metal oxide ratio of 1:1 to 3.9:1 by weight, with a gaseous water at a temperature ranging from ambient temperature to above 100° C., at a pressure ranging from ambient pressure to a steam pressure sufficient to hydrate the alkali metal silicate glass powder and for a time sufficient to hydrate no more than 4 silicon dioxide radicals in each alkali metal silicate glass molecule then the hydrated alkali metal silicate is contacted with air containing a low humidity, at sufficient temperature, pressure and time to dehydrate about 50% of the hydrated silicon dioxide radicals by evaporating off water and these processes are repeated until polymerization has taken place.

4,945,075

OXIDATIVE SECONDARY RHODIUM RECOVERY PROCESS

Michael R. Cushman; Vincent A. Nicely; Brent A. Tennant, and Joseph R. Zoeller, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 4, 1989, Ser. No. 445,253

Int. Cl.[5] B01J 38/68, 38/54; C01G 55/00; C07C 51/10

U.S. Cl. 502—24 6 Claims

1. Process for the recovery of rhodium catalyst values from a catalyst-tar solution derived from a production system in which acetic anhydride is prepared by contacting a mixture of methyl acetate and/or dimethyl ether and methyl iodide with carbon monoxide in the presence of a rhodium catalyst comprising the steps of:

1. submitting the catalyst-tar solution to an extraction with a combination of methyl iodide and aqueous hydrogen iodide and recovering (a) the aqueous phase containing most of the rhodium catalyst values, and (b) the methyl iodide phase containing most of the tar which contains minor amounts of the rhodium catalyst values;
2. treating the methyl iodide phase of step 1 with an oxidant selected from peracetic acid, hydrogen peroxide and ozone; and
3. submitting the treated methyl iodide phase of step 2 to an extraction with aqueous hydrogen iodide to recover in the aqueous phase rhodium catalyst values present in the treated methyl iodide phase.

4,945,076

POLYMERIZATION CATALYST SYSTEM

Andrzej M. Piotrowski, Peekskill, and Elliot I. Band, North Tarrytown, both of N.Y., assignors to Akzo America Inc., New York, N.Y.

Filed Jul. 28, 1989, Ser. No. 386,938

Int. Cl.[5] C08F 4/64

U.S. Cl. 502—117 14 Claims

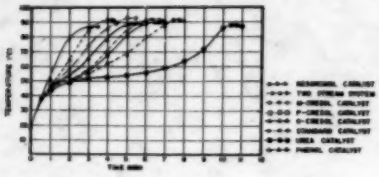
9. A catalyst for the polymerization of olefins which comprises a compound of a Group IVB transition metal and an aluminoxane catalyst component which comprises an effective amount of a hydroxysiloxane for increased activity for the polymerization.

4,945,077

MODIFIED PHENOLIC FOAM CATALYSTS AND METHOD

Paul J. Meunier, Sarnia; James Lunt, Brights Grove, and Edwin J. MacPherson, Sarnia, all of Canada, assignors to Fiberglass Canada Inc., Ontario, Canada

Division of Ser. No. 310,491, Feb. 9, 1989, Pat. No. 4,883,824, which is a continuation of Ser. No. 853,397, Apr. 18, 1986, abandoned. This application Sep. 18, 1989, Ser. No. 408,265
Int. Cl.[5] B01J *31/00*
U.S. Cl. 502—168 4 Claims



1. A modified phenolic foam catalyst comprised of an aromatic acid, a diluent and a compound selected from the group consisting of resorcinol, m-cresol, o-cresol and p-cresol.

4,945,078

MIXED BASIC METAL SULFIDE CATALYST

Erek J. Erekson, LaGrange; Anthony L. Lee, Glen Ellyn; S. Peter Barone, Hoffman Estates, and Irvine J. Solomon, Highland Park, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 274,415, Nov. 21, 1988, and a continuation-in-part of Ser. No. 274,499, Nov. 21, 1988, and a continuation-in-part of Ser. No. 274,454, Nov. 21, 1988, each is a continuation-in-part of Ser. No. 172,808, Mar. 28, 1988, Pat. No. 4,826,796. This application May 31, 1989, Ser. No. 359,207
Int. Cl.[5] B01J *21/02, 23/02, 23/04, 27/04*
U.S. Cl. 502—202 13 Claims

1. A mixed basic metal sulfide catalyst having the formula:

$$xA.yB.zC.qS$$

wherein

A is an alkali metal selected from lithium, sodium, potassium, rubidium, cesium and mixtures thereof;

B is a cation which has an ionization state 1 greater than the ionization state of C;

B is selected from scandium, yttrium, lanthanum, actinium, aluminum, boron and mixtures thereof when C is selected from beryllium, magnesium, calcium, strontium, barium, radium, zinc, cadmium, mercury and mixtures thereof and

B is selected from titanium, zirconium, hafnium, silicon and mixtures thereof when C is selected from scandium, yttrium, lanthanum, actinium, aluminum, boron and mixtures thereof;

x and y are in mole fractions of z such that when $z=1$ then $x=0.001$ to 0.25, and $y=0.001$ to 0.25; and

q is a number necessary to maintain charge balance with S being sulfur.

4,945,079

CATALYST OF NICKEL AND MOLYBDENUM SUPPORTED ON ALUMINA

Lee A. Pedersen, Allegheny County, Pa., and Alvin B. Stiles, Welshire, Del., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 670,747, Nov. 13, 1984, abandoned. This application Mar. 18, 1985, Ser. No. 712,873
Int. Cl.[5] B01J *21/04, 23/88*
U.S. Cl. 502—314 1 Claim

1. A catalyst comprising alumina having and catalytically effective amount of Ni and Mo.

4,945,080

DIRITHROMYCIN METABOLITE

Terry D. Lindstrom, and Gary W. Whitaker, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 26, 1987, Ser. No. 53,642
Int. Cl.[5] A61K *31/70;* C07H *17/08*
U.S. Cl. 514—29 3 Claims

1. Dirithromycin metabolite, which has these characteristics:

Molecular weight: 734

Empirical formula: $C_{37}H_{70}O_{12}N_2$

FAB-MS, m/z: 735 (M+H), 577, 158

FD-MS, m/z: 735 (M+H), 159

EI-MS, m/z: 577, 158

IR (KBr): FIG. 1

500 MHz ^{1}H NHR($CDCl_3$): FIG. 2

or a pharmaceutically acceptable acid addition salt thereof, in substantially pure form.

2. A composition useful for the treatment of susceptible bacterial infections comprising an effective antibacterial amount of a compound of claim 1 together with a suitable vehicle.

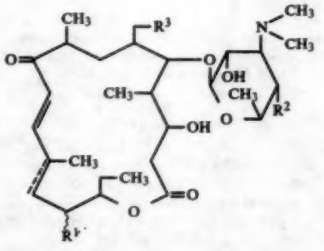
4,945,081

MYCAMINOSYL TYLONOLIDE DERIVATIVES

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Kanagawa; Tomio Takeuchi, Tokyo; Akihiro Tanaka, Tokyo, and Shuichi Sakamoto, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 861,537, May 9, 1986, Pat. No. 4,794,173. This application Aug. 16, 1988, Ser. No. 232,904
Claims priority, application Japan, May 13, 1986, 60-102402
Int. Cl.[5] A61K *31/70*
U.S. Cl. 514—30 5 Claims

1. A method of producing an antibacterial activity in a subject in need of such treatment, which comprises administering to said subject an antibacterially effective amount of a pharmaceutical composition comprised of from 10 to 1000 mg. of a mycaminosyl tylonolide derivative of the formula:



wherein R^1 is a lower alkanoyloxy group, benzoyloxy group, azido group, or amino group which may be substituted with a lower alkyl or a lower alkanoyl radical; R^2 is a hydrogen atom

or hydroxyl group; R^3 is a hydrogen atom or formyl group; and ---- means a double bond or a radical represented by

or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,945,082

CONTROLLED DSRNA THERAPY FOR HUMAN VIRAL INFECTIONS

William A. Carter, Birchrunville, Pa., assignor to HEM Research, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 136,978, Dec. 23, 1987, which is a continuation-in-part of Ser. No. 900,614, Aug. 26, 1986, Pat. No. 4,795,744, which is a continuation-in-part of Ser. No. 886,363, Jul. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,494, Aug. 26, 1985, abandoned. This application Mar. 11, 1988, Ser. No. 167,190

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—44 9 Claims

1. A method of selectively treating an HIV infection or a susceptible viral infection other than HIV which has a common mechanism of viral multiplication or pathogenesis, in whole or in part, similar to that of HIV in a person infected therewith comprising the successive steps of:

(1) measuring at least one of the person's clinically assessable parameters of the immunological system selected from the group consisting of the T4/T8 cell ratio, a skin sensitivity response to at least one predetermined antigen, and the concentration of HIV in blood or other body fluids or cells and identifying an immune deficit; thereafter

(2) again measuring the same immune parameter as measured in step (1) at a later time and identifying an immune deficit, and, if the immune deficit measured in step (2) is greater than that measured in step (1),

(3) instituting therapy with the mismatched dsRNA $rIn\text{-}r(C_{12,13},U)_n$ in a quantity and for a period of time sufficient to at least stabilize the immune deficit, as compared with the value measured in step (2), thereby at least stabilizing the HIV infection prior to the development of frank acquired immunodeficiency syndrome in that HIV-infected patient.

4,945,083

SAFE ORAL FOLIC-ACID-CONTAINING VITAMIN PREPARATION

Christian J. Jansen, Jr., 6350 Glen Coe Dr., Indianapolis, Ind. 46260

Continuation of Ser. No. 869,985, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 662,813, Oct. 22, 1984, abandoned, which is a continuation of Ser. No. 500,228, Jun. 1, 1983, abandoned, which is a continuation of Ser. No. 268,744, Jun. 1, 1981, abandoned, which is a continuation of Ser. No. 826,814, Aug. 22, 1977, abandoned, which is a continuation of Ser. No. 650,887, Jan. 21, 1976, abandoned, which is a continuation of Ser. No. 57,302, Jul. 22, 1970, abandoned. This application Feb. 1, 1989, Ser. No. 305,422

Int. Cl.[5] A61K *31/70, 31/50, 31/495*

U.S. Cl. 514—52 6 Claims

1. A method of treating or preventing macrocytic-megaloblastic anemia in humans which anemia is caused by either folic acid deficiency or by vitamin B_{12} deficiency which comprises administering a daily oral dosage of a vitamin preparation to a human in need thereof comprising at least about 0.5 mg. of vitamin B_{12} and at least about 0.5 mg. of folic acid.

4,945,084

METHOD AND COMPOSITION FOR TOPICALLY TREATING ANORECTAL OR OTHER DERMAL WOUNDS

Elias W. Packman, Merion, Pa., assignor to Norman Okman, Mountain Lakes, N.J.

Filed Jul. 8, 1987, Ser. No. 70,904

Int. Cl.[5] A61K *31/715*

U.S. Cl. 514—53 34 Claims

1. A composition for topical administration in the treatment of an anorectal disease or disorder in humans which comprises a disaccharide polysulfate-aluminum compound and a pharmaceutically-acceptable topical carrier selected from the group consisting of an ointment, cream, gel, paste, foam, aerosol, suppository, pad and gelled stick.

4,945,085

USE OF SUCRALFATE FOR CONTROLLING EMESIS AND/OR DIARRHEA

Kurt Steiner, Grafing, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft Mit Beschrinkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,510

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322078

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—53 12 Claims

1. A method of treating emesis in an animal in need of such treatment comprising administering to the animal an effective amount of sucralfate.

5. A method of treating diarrhea in a veterinary animal in need of such treatment comprising administering to the animal an effective amount of sucralfate.

9. A method of simultaneously treating emesis and diarrhea in an animal in need of such treatment comprising administering to the animal an effective amount of sucralfate.

4,945,086

SMOOTH MUSCLE CELL GROWTH INHIBITOR

William E. Benitz, and Merton Bernfield, both of Palo Alto, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed May 3, 1988, Ser. No. 189,622

Int. Cl.[5] C08B *37/10*

U.S. Cl. 514—56 29 Claims

1. A smooth muscle cell growth inhibitor, comprising a substantially pure glycosaminoglycan having smooth muscle cell growth inhibition activity and being isolatable from an endothelial-cell-conditioned medium as part of a heparan sulfate proteoglycan having molecular weight of about 10^5 to 10^7 and a buoyant density of less than 1.4 g/ml which release a glycosaminoglycan chain having a molecular weight of about 55,000 to 75,000 on protease cleavage.

15. In a method of purifying a proteoglycan smooth muscle cell growth inhibitor from a liquid medium containing said inhibitor as biochemically synthesized by endothelial cells, an improvement which comprises:

including a dialyzable detergent in said medium prior to additions of reagents which induce dissociative Or chaotropic conditions, and maintaining said detergent in the presence of said proteoglycan during said purifying.

4,945,087

TASTE MASKING OF THYMOL

Anil K. Talwar, Long Valley, and Edward J. Carlin, Secaucus, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 31, 1988, Ser. No. 175,568

Int. Cl.[5] A61K *7/16, 7/28/7/22*

U.S. Cl. 514—60 25 Claims

1. A composition comprising thymol, an effective amount of a sugar alcohol, and an effective amount of anethole wherein

the ratio of said sugar alcohol to said thymol is within the range of about 2750:1 to about 200:1, and the ratio of said anethole to said thymol is within the range of about 0.1:1 to about 1.75 to 1, wherein the combination of said sugar alcohol and said anethole mask the unpleasant taste of said thymol.

4,945,088

INSECTICIDAL WETTABLE POWDER

Yukikazu Okamoto, Ikeda; Manabu Tagami, Nishinomiya; Goro Shinjo, Toyonaka, and Kozo Tsuji, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 14, 1985, Ser. No. 701,456

Claims priority, application Japan, Sep. 21, 1982, 57-165442

Int. Cl.[5] A01N *57/00, 25/00*

U.S. Cl. 514—132 **3 Claims**

1. An insecticidal wettable powder comprising from 10 to 75% of an organo-phosphorous insecticide selected from the group consisting of fenitrothion, pirimiphos-methyl, malathion and diazinon, which is liquid at room temperature, and calcined synthetic hydrated silicon dioxide, wherein the calcined synthetic hydrated silicon dioxide is obtained by calcining a synthetic hydrated silicon dioxide at a temperature of 600° to 800° C. and is present in an amount of one-third of to equal the amount of the insecticide, said liquid organo-phosphorous insecticide not separating as an oil when the insecticidal wettable powder is mixed with water.

4,945,089

USE OF TETRAHYDROCORTEXOLONE TO PREVENT ELEVATIONS IN INTRAOCULAR PRESSURE CAUSED BY CORTICOSTEROIDS

Abbot F. Clark, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 139,222, Dec. 29, 1987, abandoned. This application Aug. 28, 1989, Ser. No. 399,351

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—171 **10 Claims**

1. A method of treating ophthalmic inflammation in a human patient which comprises applying topically to the affected eye a therapeutically effective amount of a pharmaceutical composition containing an amount of a glucocorticoid effective for the treatment of inflamed ocular tissue and an amount of tetrahydrocortexolone effective to inhibit the glucocorticoid from elevating the intraocular pressure of the patient, wherein the ratio of the amount of glucocorticoid to the amount of tetrahydrocortexolone is in the range of 10:1 to 1:20.

4,945,090

PHENOXY-SUBSTITUTED BETA-CARBOLINE DERIVATIVES, THEIR PRODUCTION AND THEIR USE AS DRUGS

Ralph Schmiechen; Dieter Seidelmann; Andreas Huth; Herbert H. Schneider; David N. Stephens, all of Berlin, Fed. Rep. of Germany; Mogens Engelstoft, Vaerlose, Denmark; John B. Hansen, Lyngby, Denmark, and Erling Petersen, Glostrup, Denmark, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

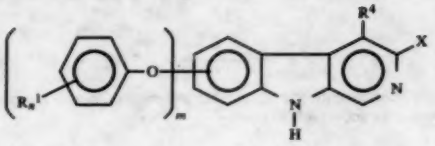
Filed Nov. 13, 1986, Ser. No. 929,861

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540654

Int. Cl.[5] A61K *31/38, 31/435;* C07D *471/04*

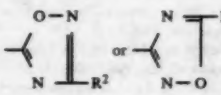
U.S. Cl. 514—232.8 **22 Claims**

1. A phenoxy-substituted beta-carboline of the formula



wherein

X is $COOR^3$, $CONHC_{1-3}$ alkyl or an oxadiazolyl radical of the formula



R^2 is H, C_{1-6}-alkyl or C_{3-7} cycloalkyl,

R^3 is C_{1-6}-alkyl,

R^4 is hydrogen, C_{1-6}-alkyl or C_{1-6}-alkoxy-C_{1-6}-alkyl,

R^1 is halogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{1-4}-alkanoyl, phenyl, C_{2-5} alkylenedioxy, trifluoromethyl, cyano, nitro, C_{1-6}-alkoxycarbonyl, azido, SO_2R^6, $SO_2NR^7R^8$, or NR^9NR^{10},

R^6 is C_{1-6}-alkyl,

R^7 and R^8 independently are C_{1-6}-alkyl or together with the connecting nitrogen atom form a saturated hereto ring of 5 or 6 members, or such a ring wherein one or two CH_2 groups are replaced by O, S or N,

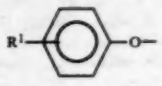
R^9 and R^{10} independently are each hydrogen, C_{1-6}-alkyl, C_{1-4}-alkanoyl or together with the connecting nitrogen atom form a saturated hetero ring of 5 or 6 members, or such a ring wherein one or two CH_2 groups are replaced by O, S or N,

n is 0 to 5, and

m is 1–2,

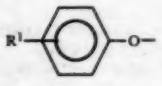
with the proviso that X is not COOEt, when

(a)



is 5-phenoxy and R^4 is methyl or when

(b)



is 6-(4-methoxyphenoxy) and R^4 is methoxymethyl.

10. 5(4-chlorophenoxy)-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-4-methoxymethyl-beta carboline

5-phenoxy-4-methyl-3-(3-ethyl-1,2,4-xoadiazol-5-yl)-beta-carboline

5-(4-nitrophenoxy)-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline

5-(4-chlorophenoxy)-4-methyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline

6-phenoxy-4-methyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline

6-(4-chlorophenoxy)-4-methyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline

6-(4-aminophenoxy)-4-methyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline

6-(4-chlorophenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline

6-(4-chlorophenoxy)-4-methoxymethyl-3-(3-cyclopropyl-1,2,4-oxadiazol-5-yl)-beta-carboline
6-(4-morpholinosulfamoylphenoxy)-4-methoxymethyl-3-(3-cyclopropyl-1,2,4-oxadiazol-5-yl)-beta-carboline
6-(4-4-methylsulfonylphenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline
6-(2-chlorophenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline
6-(2,4-dichlorophenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline
5-(4-nitrophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(4-nitro-2-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
6-(4-nitrophenoxy)-4-methyl-beta-carboline-3-carboxylic acid ethyl ester
6-(4-nitrophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(4-aminophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-phenoxy-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(3-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(2-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
6-phenoxy-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(4-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(4-chlorophenoxy)-4-methyl-beta-carboline-3-carboxylic acid ethyl ester
5-(2,4-dichlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
6-(4-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-(2-chlorophenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline
5-(3-chlorophenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline
5-(2-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(2-nitrophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(2-cyano-3-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(2-cyanophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(4-acetylphenoxy)-4-methoxymethyl-3-(3-ethyl-1,2,4-oxadiazol-5-yl)-beta-carboline
6-(3-methylphenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(3-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(2,4-dichlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid ethyl ester
5-phenoxy-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
5-(4-chlorophenoxy)-4-methyl-beta-carboline-3-carboxylic acid isopropyl ester
5-(4-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(4-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(4-fluorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
6-(3,4-dichlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropyl ester
5-phenoxy-4-methoxymethyl-beta-carboline-3-carboxylic acid t-butyl ester
6-phenoxy-4-methoxymethyl-beta-carboline-3-carboxylic acid t-butyl ester or
5-(4-chlorophenoxy)-4-methoxymethyl-beta-carboline-3-carboxylic acid isopropylamide.

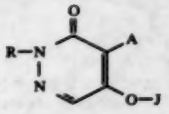
4,945,091

3(2H)-PYRIDAZINONE COMPOUNDS DERIVATIVES AND COMPOSITIONS FOR CONTROLLING AND/OR PREVENTING INSECT PESTS INTERMEDIATES FOR SUCH COMPOUNDS, AND A PROCESS FOR THEIR MANUFACTURE

Takahiro Makabe; Tomoyuki Ogura; Yasuo Kawamura; Tatsuo Numata, all of Funabashi; Kiminori Hirata, Minamisaitama; Masaki Kudo, Minamisaitama; Toshiro Miyake, Minamisaitama, and Hiroshi Haruyama, Minamisaitama, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,664
Claims priority, application Japan, Jul. 30, 1987, 62-191289; Dec. 17, 1987, 62-319336
Int. Cl.[5] A01N *43/58*; C07D *237/16*
U.S. Cl. 514—252 12 Claims

1. A 3(2H)-pyridazinone compound of the formula



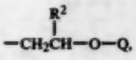
[I]

wherein,

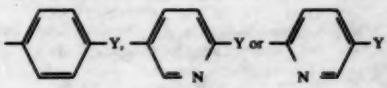
R represents an alkyl group having 3 to 6 carbon atoms substituted by 1 to 3 halogen atoms;

A represents halogen atom;

J represents —CH_2—Q or



in which R^2 represents hydrogen atom or methyl group and Q represent



in which Y is selected from the group consisting of hydrogen atom, halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a haloalkyl group having 1 to 4 carbon atoms and a haloalkoxy group having 1 to 4 carbon atoms.

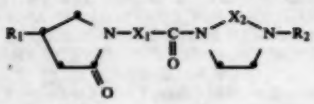
4,945,092

SUBSTITUTED 1-(OXOPYRROLIDINYLALKANOYL)-PIPERAZINES USEFUL AS NOOTROPICS

William Bencze, Therwil; Wolfgang Fröstl, Basel, and Max Wilhelm, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

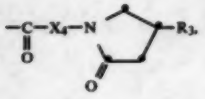
Continuation of Ser. No. 191,671, May 9, 1988, abandoned, which is a division of Ser. No. 5,974, Jan. 21, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 370,093
Claims priority, application Switzerland, Jan. 30, 1986, 346/86
Int. Cl.[5] A61K *31/495*; C07D *403/12, 403/14*
U.S. Cl. 514—252 17 Claims

1. A compound of the formula



(I)

wherein R_1 represents a phenyl or naphthyl that is unsubstituted or mono- or di-substituted by at least one of lower alkyl, lower alkoxy, halogen and trifluoromethyl, X_1 represents lower alkylidene, X_2 represents ethylene or oxoethylene and R_2 represents hydrogen, lower alkyl or a radical of the formula



(Ia)

wherein X_4 represents lower alkylidene and R_3 represents hydrogen or phenyl or naphthyl that is unsubstituted or mono- or di-substituted by at least one of lower alkyl, lower alkoxy, halogen and trifluoromethyl, in free form or in the form of pharmaceutically acceptable salt.

17. Method for the treatment of cerebral insufficiency in human or animal body comprising administering a nootropically effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,945,093

NOVEL DERIVATIVES OF UREYLENE, 2,4-TRIAMINOPYRIMIDINE-3- OXIDE, THEIR PREPARATION AND USE IN COSMETIC AND PHARMACEUTICAL COMPOSITIONS

Jean Maignan, Tremblay-les-Gonesse; Serge Restle, Aulnay-sous-Bois, and Gerard Lang, Saint-Gratien, all of France, assignors to L'Oreal, Paris, France

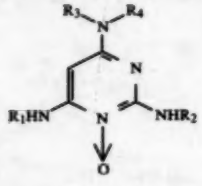
Filed Jul. 29, 1988, Ser. No. 225,849

Claims priority, application Luxembourg, Jul. 31, 1987, 86959

Int. Cl.[5] A61K *31/505, 31/535;* **C07D** *413/04, 239/28*

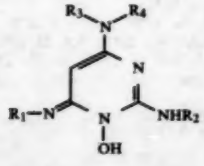
U.S. Cl. 514—235.8 **11 Claims**

1. A compound having the general formula:

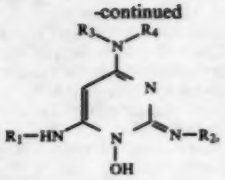


(I)

which has tautomeric forms represented by the general formulae:



(IA)

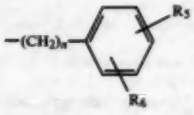


(IB)

wherein R_3 and R_4 are either

(i) be identical or different and are selected from the group consisting of a hydrogen atom, a linear or branched C_1–C_{18} alkyl group, an alkenyl group having 2 to 18 carbon atoms, a cycloalkyl group having 5 to 8 carbon atoms which may have one or more substituent selected from the group consisting of a lower alkyl group, an alkenyl group and a cycloalkyl group, wherein said alkenyl and cycloalkyl group may each have one or more substituent hydroxyl groups,

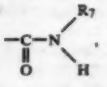
(ii) an aryl group or an aralkyl group having the general formula:



(II)

wherein n can be 0 to 4, and R_5 and R_6 may be identical or different and are selected from the group consisting of a hydrogen atom, a C_1 to C_8 lower alkyl group, a nitro group, a hydroxyl group, an alkoxy group, a halogen atom, a carboxyl group, and the salts, esters, or amides of any of the preceding groups, or

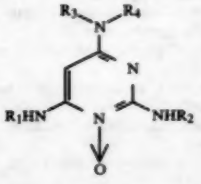
(iii) together with the nitrogen atom to which they are each linked, form a heterocyclic group selected from the group consisting of morpholino, piperidino, pyrrolidino, piperazino, and 4'-N-alkylpiperazino, and R_1 and R_2 are selected from the group consisting of a hydrogen atom and a carbamoyl group having the formula:



(III)

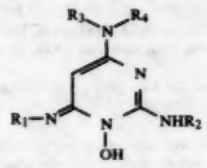
wherein R_1 and R_2 may be identical or different but are not both hydrogen, R_7 is selected from the group consisting of a linear or branched C_1 to C_{18} alkyl group, a C_2 to C_{18} alkenyl group, a C_5 to C_8 cycloalkyl group, and an aryl or aralkyl group corresponding to said formula (II).

8. A pharmaceutical composition for the treatment of alopecia, hair loss, or desquamating dermatitis containing a carrier suitable for topical application and an effective amount of at least one compound having the general formula:

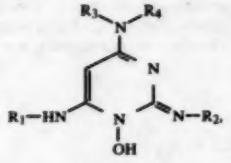


(I)

which has tautomeric forms represented by the general formulae:



(IA)

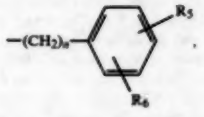


(IB)

wherein R_3 and R_4 are either

(i) be identical or different and are selected from the group consisting of a hydrogen atom, a linear or branched C_1–C_{18} alkyl group, an alkenyl group having 2 to 18 carbon atoms, a cycloalkyl group having 5 to 8 carbon atoms which may have one or more substituent selected from the group consisting of a lower alkyl group, an alkenyl group and a cycloalkyl group, wherein said alkenyl and cycloalkyl group may each have one or more substituent hydroxyl groups,

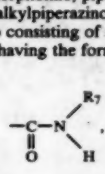
(ii) an aryl group or an aralkyl group having the general formula:



(II)

wherein n can be 0 to 4, and R_5 and R_6 may be identical or different and are selected from the group consisting of a hydrogen atom, a C_1 to C_6 lower alkyl group, a nitro group, a hydroxyl group, an alkoxy group, a halogen atom, a carboxyl group, and the salts, esters, or amides of any of the preceding groups, or

(iii) together with the nitrogen atom to which they are each linked, form a heterocyclic group selected from the group consisting of morpholino, piperidino, pyrrolidino, piperazino, and 4'-N-alkylpiperazino, and R_1 and R_2 are selected from the group consisting of a hydrogen atom and a carbamoyl group having the formula:



(III)

wherein R_1 and R_2 may be identical or different but are not both hydrogen, R_7 is selected from the group consisting of a linear or branched C_1 to C_{18} alkyl group, a C_2 to C_{18} alkenyl group, a C_5 to C_8 cycloalkyl group, and an aryl or aralkyl group corresponding to said formula (II).

4,945,094

SYNERGISTIC BIOLOGICALLY ACTIVE SUBSTANCES

Awa S. M. Salim, Department of Surgery, Royal Infirmary, Perth, PH1 1NX, Scotland

Filed Feb. 1, 1988, Ser. No. 151,220
Int. Cl.[5] A61K *31/52*
U.S. Cl. 514—264 **15 Claims**

1. A combination for use in improving the condition of skin, which combination comprises a xanthene and procaine and a physiologically acceptable, organic, in vivo sulphydryl group releasing agent selected from the group consisting of cysteine, cysteamine, cystine, dimethylsulphonxide, methionine wherein the carboxyl group has been esterified, s-methyl substituted ternary sulphonium, derivatives of methionine and dithioglycerol wherein said procaine and said agent are present in relative proportions

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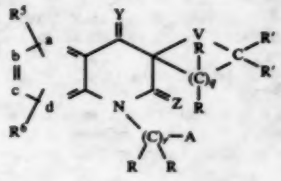
4,945,095

METHOD FOR SUPPRESSING THE IMMUNE RESPONSE

Sidney R. Smith, 700 Spring Ave., Ridgewood, N.J. 07450, and Marvin I. Siegel, 507 Maple Hill Dr., Woodbridge, N.J. 07095

Filed Dec. 12, 1985, Ser. No. 808,404
Int. Cl.[5] A61K *31/44*
U.S. Cl. 514—278 **15 Claims**

1. A method for suppressing T cell functions of the immune response in a mammal which comprises administering to a mammal in need of such treatment an immunosuppressing effective amount of a compound having the structural formula I:



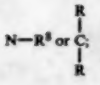
I

or solvate thereof, wherein:

two of the ring groups a, b, c and d may be CH or N and the remaining two groups represent CH;

Y and Z independently represent O or S;

V represents O, $S(O)_n$,



each R independently represents hydrogen, C_1 to C_6 alkyl, CH_2OH, COR_7 (wherein R^7 represents hydrogen or C_1 to C_6 alkyl) or hydroxy, with the proviso that only one hydroxy group can be attached to one carbon atom;

each R' independently is as defined for R above, except that when V represents O, $S(O)_n$ or N-R^8, R' may not be hydroxy;

R^8 is hydrogen, alkyl having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 7 carbon atoms, alkylsulfonyl having from 1 to 6 carbon atoms, carboalkoxy having from 2 to 7 carbon atoms, $CONH_2$, phenyl or pyridyl of which the last two may be substituted with up to three substituents, Q, whereby each Q independently is hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynyloxy having from 3 to 6 carbon atoms, $S(O)_n$-R^a {wherein n is defined herein and R^a is alkyl having from 1 to 6 carbon atoms}, $NHSO_2R^a$ {wherein R^a is defined herein}, $NHSO_2CF_3$, SO_2NH_2, COR^b {wherein R^b is OH, NH_2 or OR^a (wherein R^a is defined herein)}, O-B-COR^b {wherein B is alkylene having from 1 to 4 carbon atoms and R^b is defined herein}, or $NHCOR^c$ {wherein R^c is hydrogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, COR^d (wherein R^d is hydroxy or alkoxy having from 1 to 6 carbon atoms) or

NHR^e (wherein R^e is hydrogen or alkyl having 1 to 6 carbon atoms));

R^5 and R^6 may be the same or different and are hydrogen, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, alkylthio having 1 to 6 carbon atoms or cyano;

n is 0, 1 or 2;

r is 0, 1 or 2;

q is an integer of from 1 to 5; and

A is phenyl, naphthyl, indenyl, indanyl, 2-, 3- or 4-pyridyl, 2-, 4-, 5- or 6-pyrimidyl, 2- or 3-pyrazinyl, 2- or 3-furyl, 2- or 3-thienyl, 2-, 4- or 5-imidazolyl, 2-, 4- or 5-thiazolyl or 2-, 4- or 5-oxazolyl, any of which may be substituted with up to three substituents Q as defined herein above.

4,945,096

TREATMENT OF A DEPRESSIVE STATE WITH 2-[(4-PIPERIDYL)METHYL]-1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATES

Pascal George, Vitry-sur-Seine, and Mireille Sevrin, Paris, both of France, assignors to Synthelabo, Paris, France

Division of Ser. No. 228,748, Aug. 5, 1988, Pat. No. 4,885,302. This application Aug. 30, 1989, Ser. No. 400,811

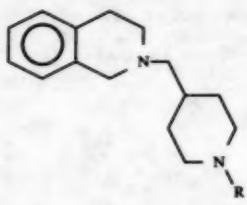
Claims priority, application France, Aug. 7, 1987, 87 11288; Dec. 30, 1987, 87 18342; Apr. 19, 1988, 88 05129; Apr. 19, 1988, 88 05130

Int. Cl.[5] A61K *31/47*

U.S. Cl. 514—307 **1 Claim**

1. A method of treatment of a depressive state which comprises administering, to a subject suffering or liable to suffer from said state an effective amount of the compound of formula (I)

(I)



in which R is

(a) a hydrogen atom;

(b) a linear or branched (C_1–C_6) alkyl group; an allyl group; a cycloalkylmethyl group in which the cycloalkyl moiety has from 3 to 6 carbon atoms; a phenylmethyl group unsubstituted or substituted with one to three substituents chosen from halogen atoms and trifluoromethyl, nitro, amino, dimethylamino, cyano, aminocarbonyl, linear or branched (C_1–C_3) alkyl, linear or branched (C_1–C_3) alkoxy an linear or branched (C_1–C_3) alkylthio groups; a 2-phenylethyl group; a 3-phenylpropyl group; a 3-phenyl-2-propenyl group; a phenylcarbonylmethyl group; a naphthylmethyl group; a pyridylmethyl group; a furylmethyl group; or a thienylmethyl group; or

(c) a linear or branched (C_2–C_6) alkanoyl group; a cycloalkylcarbonyl group in which the cycloalkyl moiety has from 3 to 6 carbon atoms; a trifluoroacetyl group; a phenylcarbonyl group unsubstituted or substituted with one to three substituents chosen from halogen atoms and trifluoromethyl, nitro, linear or branched (C_1–C_3) alkyl, linear or branched (C_1–C_3) alkoxy and linear or branched (C_1–C_3) alkylthio groups; a 1-oxo-3-phenyl-2-propenyl group; a naphthylcarbonyl group; a pyridylcarbonyl group; a furylcarbonyl group; a thienylcarbonyl group; a (2-indolyl)carbonyl group; or a (3-indolyl)carbonyl group; or a pharmacologically acceptable acid addition salt thereof.

4,945,097

ARYL-CYCLOALKYL-ALKANOLAMINES FOR TREATMENT OF NEUROTOXIC INJURY

John W. Olney, Ladue, Mo., assignor to G. D. Searle & Co., Chicago, Ill.

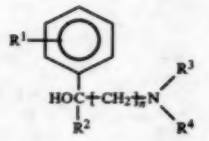
Filed Oct. 23, 1987, Ser. No. 112,659

Int. Cl.[5] A61K *31/40, 31/445*

U.S. Cl. 514—318 **9 Claims**

1. A method to control excitotoxic neuropathological processes and the neurodegenerative consequences thereof in mammals, which method comprises treating a mammal susceptible to or suffering from anoxia, hypoxia or ischemia with a therapeutically-effective amount of a compound of the formula

(I)



wherein R^1 is one or more groups independently selected from hydrido, halo, alkyl, acyl, hydroxyalkyl, haloalkyl, aminoalkyl, alkoxy, amino alkylamino and acylamino; wherein R^2 is selected from hydrido, cycloalkyl, cycloalkenyl, halocycloalkyl, alkylcycloalkyl, acylcycloalkyl, hydroxycycloalkyl, haloalkylcycloalkyl, aminoalkylcycloalkyl, alkoxycycloalkyl, aminocycloalkyl, bicycloalkyl, bicycloalkenyl and tricycloalkyl wherein the bicycloalkyl, bicycloalkenyl and tricycloalkenyl groups may be substituted with one or more groups selected from alkyl, halo acyl, hydroxy, hydroxyalkyl, haloalkyl, acyl, alkoxy, amino and alkylamino; wherein each of R^3 and R^4 is independently selected from hydrido, alkyl, acyl, alkenyl, cycloalkyl, phenylalkyl, phenyl, aminoalkyl and alkylaminoalkyl; and wherein R^3 and R^4 together to form a cyclic group including the nitrogen atom of Formula I, and n is an integer selected from one through five.

4,945,098

NOVEL PROPANE-1,3-DIOL DERIVATIVES AND USE

Gunnar Grue-Sorensen, Olstykke, and Christian K. Nielsen, V rlose, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab), Ballerup, Denmark

PCT No. PCT/DK86/00128, § 371 Date Jul. 10, 1987, § 102(e) Date Jul. 10, 1987, PCT Pub. No. WO87/03281, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 20, 1986, Ser. No. 78,525

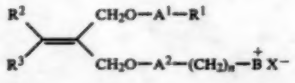
Claims priority, application United Kingdom, Nov. 25, 1985, 8528959

Int. Cl.[5] C07D *275/02*; A61K *31/41*

U.S. Cl. 514—365 **12 Claims**

1. A compound of the formula I

I



where O—A^1 and O—A^2, which can be the same or different, each represents O, O—C(O), O—C(O)NH, O—C(S)NH or O—C(O)O, R^1 represents an alkyl or alkenyl group of 10–22 carbon atoms, n is an integer from 1 to 11, B^+ represents N^+(Het), where —N^+(Het) stands for 1-pyridinio, 1-pyridazinio, 1-pyrimidinio, 1-pyrazinio, 3-oxazolio, 3-thiazolio, 1-isoquinolinio, 1-quinolinio, 3-alkyl-1-imid-azolio; X^- means the anion of a pharmaceutically acceptable inorganic or organic acid; and R^2 and R^3 are the same or different, and represent hydrogen or alkyl groups of 1–4 carbon atoms.

4,945,099

ANTI-INFLAMMATORY AGENTS

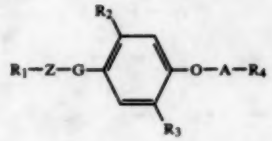
Nancy G. Bollinger; Theodore Goodson, Jr., and David K. Herron, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 2,542, Jan. 12, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 361,873

Int. Cl.[5] **C07D** *257/04;* **A61K** *31/41, 31/275;* **C07C** *49/84*

U.S. Cl. 514—381 **20 Claims**

1. A compound of the formula



I

or a pharmaceutically acceptable base addition salt thereof, wherein

R_1 is hydrogen or R'OOC—;

Z is $—(CH_2)_n—$ or phenylene;

n is 1–8;

G is

R_2 is hydroxy, halo, or $—O—(CH_2)_m—Y$;

R_3 is C_1–C_6 alkyl, C_1–C_6 alkanoyl, C_2–C_4 alkenyl, C_1–C_4 alkoxy, hydroxy-substituted C_1–C_3 alkyl, or $—CH_2—D$;

A is a bond or straight or branched chain C_1–C_{10} alkylidene;

R_4 is —CN, $—COR_7$, 5-tetrazolyl optionally substituted with a C_1–C_4 alkyl group or $—(CH_2)_qCOOR'$, or phenyl substituted with one or two groups selected from cyano, $—CH_2CN$, 5-tetrazolyl, or 5-tetrazolyl substituted with C_1–C_4 alkyl or $—(CH_2)_q—COOR'$;

where each R' is independently hydrogen or C_1–C_4 alkyl;

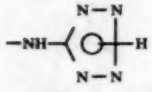
m is 1–4;

q is 1–4;

Y is hydrogen or —CN;

D is halo, C_1–C_4 alkoxy, or $—S—(C_1$–C_4 alkyl); and

R_7 is



provided that when A is a bond, R_4 must be a substituted phenyl group.

4,945,100

PROCESS FOR THE PREPARATION OF 1-TRIAZOLYLETHYL ETHER DERIVATIVES

Robert Nyfeler, Basel; Helmut Zondler, Bottmingen, and Elmar Sturm, Aesch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

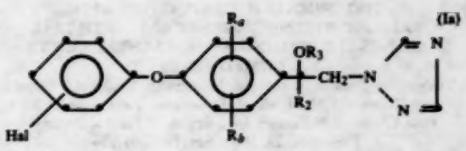
Continuation of Ser. No. 815,681, Jan. 2, 1986, abandoned, which is a division of Ser. No. 610,224, May 14, 1984, abandoned. This application Sep. 2, 1988, Ser. No. 240,441

Claims priority, application Switzerland, May 19, 1983, 2730/83

Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **10 Claims**

1. A compound of formula Ia



(Ia)

in which Hal is halogen;

R_a and r_b independently of one another are hydrogen, halogen, C_1–C_6-halogenoalkyl, C_1–C_6-halogenoalkoxy, C_1–C_6-alkoxy, C_1–C_5-alkyl, nitro and/or cyano, with the proviso that at least one of R_a and R_b is not hydrogen;

R_2 is C_1–C_{12}-alkyl, C_1–C_6-alkyl which is substituted by C_1–C_5-alkoxy or C_3–C_8-cycloalkyl, C_3–C_8-cycloalkyl, phenyl which is unsubstituted or monosubstituted to trisubstituted by halogen, C_1–C_6-halogenoalkyl, C_1–C_6-halogenoalkoxy, C_1–C_6 alkoxy, C_1–C_6-alkyl, phenoxy, halogenophenoxy, phenyl, benzyl, halogenobenzyl, nitro and/or cyano, or benzyl which is unsubstituted or monosubstituted to trisubstituted by halogen, C_1–C_6-halogenoalkyl, C_1–C_6-alkoxy, C_1–C_6-alkyl, nitro and/or cyano; and

R_3 is C_1–C_6-alkyl which is unsubstituted or substituted by C_1–C_3-alkoxy, or is C_3–C_4-alkenyl, benzyl or halogenobenzyl.

4,945,101

FUNGICIDAL NOVEL HYDROXYALKYNYL-AZOLYL DERIVATIVES

Gerhard Jäger, Leverkusen; Klaus Böckmann, Cologne; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen; Paul-Ernst Frohberger, Leverkusen, and Hans Scheinpflug, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

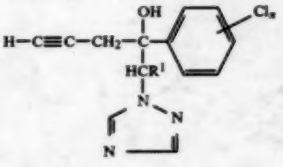
Division of Ser. No. 498,606, May 27, 1983, Pat. No. 4,578,396. This application Oct. 4, 1985, Ser. No. 784,405

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1982, 3222191

Int. Cl.[5] **A01N** *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **5 Claims**

1. A hydroxyalkynyl-azolyl derivative of the formula



in which

n is 0, 1 or 2, and

R^1 is hydrogen or methyl, or an addition product thereof with an acid or metal salt.

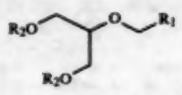
4,945,102

HETEROCYCLIC DERIVATIVES AND RADIOSENSITIZING AGENTS AND ANTIVIRAL AGENTS COMPRISING SAME AS THEIR ACTIVE COMPONENT

Toshimitsu Suzuki; Masakazu Sakaguchi; Yoshiyuki Miyata, and Tomoyuki Mori, all of Yokohama, Japan, assignors to Pola Chemical Industries Inc., Japan, Shimoka, Japan

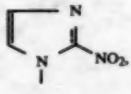
Filed Sep. 21, 1988, Ser. No. 247,376
Claims priority, application Japan, Oct. 22, 1987, 62-267485
Int. Cl.[5] C07D *233/91;* A61K *31/415*
U.S. Cl. 514—398 **3 Claims**

1. A heterocyclic derivative of the following formula (I):



(I)

wherein R_1 represents



and R_2 represents a hydrogen atom or an acetyl group.

4,945,103

METHOD OF TREATING PRE-MENSTRUAL SYNDROME

Michael Cohen, Kerkeboslaan 4A, Wessenaar, Netherlands

Filed Jan. 17, 1989, Ser. No. 297,328
Int. Cl.[5] A61K *31/40, 31/58*
U.S. Cl. 514—419 **14 Claims**

1. A method of alleviating premenstrual anxiety, irritability, depression, confusion, fatigue, insomnia, hypersomnia, weight gain, abdominal bloating, pain or tenderness, breast swelling or tenderness, pelvic pain or cramps, increased appetite or weight gain, edema, or a combination thereof which comprises the administration, on a cyclic schedule, of melatonin in a series of daily doses to a human female of child-bearing years who suffers symptoms of PMS, said administration at dosage levels sufficient to alleviate said symptoms.

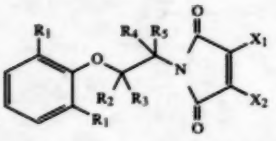
4,945,104

MALEIMIDE DERIVATIVES AND USE THEREOF IN AGRICULTURAL AND HORTICULTURAL FUNGICIDES

Harukazu Fukami, Kyoto; Masaki Hashimoto, Ibaraki; Shinjiro Niwata, Toyonaka; Norio Ohtsuka, Hiratsuka, and Fumio Fujita, Yokohama, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Jun. 23, 1989, Ser. No. 370,800
Int. Cl.[5] A01N *37/32;* C07D *207/456*
U.S. Cl. 514—425 **3 Claims**

1. A maleimide derivative having the formula (I):



(I)

wherein R_1 represents a lower alkyl group having 1 to 4 carbon atoms, R_2, R_3, R_4 and R_5 independently represent a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a phenyl group, a chlorophenol group, a tolyl group or an aralkyl group having 7 to 10 carbon atoms, and X_1 and X_2 independently represent a hydrogen atom or a halogen atom.

3. An agricultural and horizontal fungicide comprising, as an active ingredient, a maleimide derivative represented by the formula (I) of claim 1.

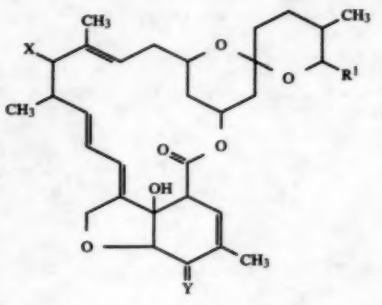
4,945,105

13-HALOMILBEMYCIN DERIVATIVES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Kazuo Sato; Toshiaki Yanai; Noritoshi Kitano, all of Tokyo; Akira Nishida, Shiga, all of Japan; Bruno Frei, Liestal, and Anthony O'Sullivan, Basel, both of Switzerland, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 866,571, May 22, 1986, abandoned.
This application Dec. 28, 1988, Ser. No. 290,835
Claims priority, application Japan, May 31, 1985, 60-118629
Int. Cl.[5] A61K *31/364;* C07D *313/00*
U.S. Cl. 514—450 **54 Claims**

1. A milbemycin compound of formula (I):



(I)

in which:

R^1 represents a methyl group, an ethyl group, an isopropyl group or a sec-butyl group;

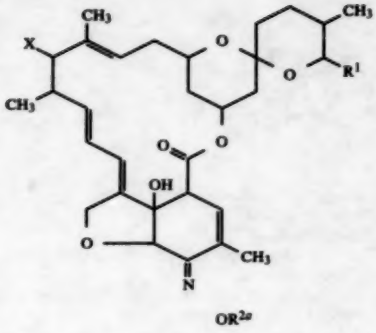
X represents a halogen atom; and

Y represents an oxygen atom or a group of formula $=N—OR^2$, wherein

R2 represents a hyrogen atom, a C_1–C_6 alkyl group, a C_7–C_9 phenylalkyl group, a C_7–C_9 phenylalkyl group having at least one substituent on the phenyl ring selected from the group consisting of C_1–C_6 alkyl, halogen and nitro substituents or a group of formula $—CH_2COOR^3$, in which R^3 represents a hydrogen atom or a C_1–C_6 alkyl group;

and, when R^2 represents a hydrogen atom, a salt or ester thereof.

5. A milbemycin compound of formula (Ia):



(Ia)

wherein:

R^1 represents a methyl group, an ethyl group, an isopropyl group or a sec-butyl group;

X represents a halogen atom; and

R^{2a} represents:

a group of formula —COR^4, in which R^4 represents a C_1–C_{20} alkyl group, a C_2–C_{20} alkenyl group, a C_3–C_8 cycloalkyl group, a C_7–C_9 phenylalkyl group, a C_7–C_9 phenylalkyl group having at least one substituent on the phenyl ring selected from the group consisting of C_1–C_6 alkyl, halogen and nitro substituents, a phenyl group, a phenyl group having at least one substituent selected from the group consisting of C_1–C_6 alkyl, halogen, nitro, carboxy and C_2–C_7 alkoxycarbonyl substituents or a group of formula —$(CH_2)_nCOOR^5$, wherein n is an integer from 1 to 3 and R^5 represents a hydrogen atom or a C_1–C_6 alkyl group;

a group of formula —$CZ.NR^6R^7$, wherein R^6 and R^7 are the same or different and each represents a hydrogen atom, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, a C_2–C_6 alkynyl group, a phenyl group or a phenyl group having at least one substituent selected from the group consisting of C_1–C_6 alkyl and halogen and Z represents an oxygen or sulfur atom;

a group of formula —$COOR^8$, wherein R^8 represents: a C_1–C_6 alkyl group; a C_7–C_9 phenylalkyl group, a C_7–C_9 phenylalkyl group having at least one substituent on the phenyl ring selected from the group consisting of C_1–C_6 alkyl, halogen and nitro substituents; a phenyl group; a phenyl group having at least one substituent selected from the group consisting of C_1–C_6 alkyl and halogen; a group of formula —CH_2(—O—CO)$_m$—B where m is 0 or 1 and B represents an oxygen-containing heterocyclic group having 5 or 6 ring atoms or said heterocyclic group having at least one C_1–C_4 alkyl substituent; or a group derived by removing an omega-hydroxy group from a sugar alcohol selected from the group consisting of glycerol, erythritol, threitol, arabinitol, adenitol, xylitol, sorbitol, mannitol and dulcitol or said sugar alcohol being protected by a group selected from the group consisting of formyl, acetyl, tetrahydro-2-furanyl, tetrahydro-2-pyranyl, 1-methoxyethyl, 1-ethoxyethyl, trimethylsilyl, triethylsilyl and dimethyl-t-butylsilyl;

a group of formula —SO_2R^9, wherein R^9 represents a C_1–C_6 alkyl group, a phenyl group, or a phenyl group having at least one substituent selected from the group consisting of C_1–C_6 alkyl and halogen; or

a group of formula —(Z=)P(—OR^{10})$_2$, in which Z is as defined above, and each of the groups represented by R^{10}, which may be the same or different, is a C_1–C_6 alkyl group.

29. A composition as claimed in claim **27**, wherein Y represents a group of formula =N—OH.

33. A composition as claimed in claim **31**, where R^{2a} represents:

a group of formula —$CO.NR^6R^7$ where R^6 and R^7 are independently selected from the group consisting of hydrogen atoms and C_1–C_6 alkyl groups;

a group of formula —COR^4 where R^4 represents a C_1–C_{20} alkyl group, a benzyl group or a phenyl group; or a group of formula —$COOR^8$ where R^8 represents a C_1–C_6 alkyl group, a benzyl group or a phenyl group.

4,945,106

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, United Kingdom

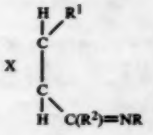
Continuation of Ser. No. 807,442, Dec. 10, 1985, abandoned, which is a division of Ser. No. 349,084, Feb. 12, 1982, Pat. No. 4,596,823. This application Jul. 6, 1989, Ser. No. 377,760

Claims priority, application United Kingdom, Jul. 1, 1980, 8021537

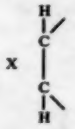
Int. Cl.[5] **C07C** *177/00*; **A61K** *31/557*

U.S. Cl. 514—469 **45 Claims**

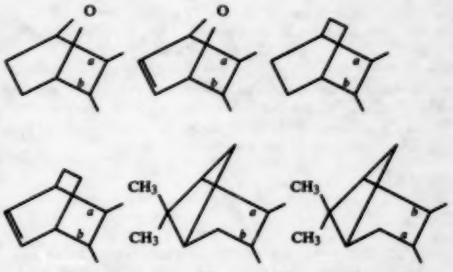
1. A compound of the formula (I)



wherein



represents one of the divalent cyclic groups



the letters a and b indicating in each case the points of attachment of the substituents R^1 and $C(R^2)$=NR, respectively; wherein

R^1 is a group of the formula R'—COQ where R' is selected from the group consisting of (—CH_2)$_j$— where j is an integer from 4 to 8; —CH=CH—$(CH_2)_k$—, where k is 2 or 3; —CH_2—CH=CH—$(CH_2)_m$—, where m is an integer from 1 to 5; —CH_2—CH_2—CH=CH—$(CH_2)_n$—, where n is 0 or an integer from 1 to 4; —X—$(CH_2)_p$—, where p is an integer from 3 to 7; —CH_2—X—$(CH_2)_q$—, where q is an integer from 2 to 6; and —CH_2—CH_2—X—$(CH_2)_m$—, where X is O or S; and COQ is carboxy, a

physiologically acceptable carboxylate salt, a C_1–C_5 alkyl ester or $CONHSO_2CH_3$;

R^2 is selected from the group consisting of hydrogen, $C_{1\text{-}10}$ aliphatic hydrocarbon groups, and $C_{1\text{-}10}$ aliphatic hydrocarbon groups substituted by Ar, OAr or SAr, where Ar represents a phenyl, naphthyl, fluorenyl, dibenzocyclohexyl, dibenzocycloheptyl, pyridyl, benzthiazolyl, dihydrobenzthiazolyl, N-methyldihydrobenzthiazolyl, benzoxazolyl, dihydrobenzoxazolyl or N-methyldihydrobenzoxazolyl group or such a group substituted by one or more substituents selected from $C_{1\text{-}10}$ alkoxy, halogen, $C_{1\text{-}10}$ halogen-substituted alkyl, sulphamoyl, amino, hydroxyl, nitro and $C_{1\text{-}10}$ alkyl groups;

and R is a group $—OR^3$, $—OR^4$, $—A—R^3OR—N{=}R^5$ in which A is —NH—, —NH.CO—, $NH.CO.CH_2N(R^6)$—, $—NH.SO_2—$, —NH.CO.NH— or —NH.CS.NH— and wherein R^3 is a $C_{1\text{-}10}$ aliphatic hydrocarbon group, a group Ar or a $C_{1\text{-}10}$ aliphatic hydrocarbon group substituted by one or more groups selected from Ar, OAr and SAr; R^4 is a $C_{1\text{-}10}$ aliphatic hydrocarbon group which is substituted through an oxygen atom by a $C_{1\text{-}10}$ aliphatic hydrocarbon group which is itself substituted by one or more groups Ar; R^5 is a $C_{1\text{-}10}$ aliphatic hydrocarbon group, a group Ar', where Ar' represents a fluorenylidene, dibenzocyclohexylidene, dibenzocycloheptylidene, dihydrobenzthiazolylidene, N-methyldihydrobenzthiazolylidene, dihydrobenzoxazolylidene or N-methyldihydrobenzoxazolylidene group or such a group substituted on a benzene ring or rings thereof by one or more substituents selected from $C_{1\text{-}10}$ alkoxy, halogen, $C_{1\text{-}10}$ halogen-substituted alkyl, sulphamoyl, amino, hydroxyl, nitro and $C_{1\text{-}10}$ alkyl groups, or a $C_{1\text{-}10}$ aliphatic hydrocarbon group substituted by one or more groups selected from Ar, OAr and SAr; and R^6 is hydrogen, a $C_{1\text{-}10}$ aliphatic hydrocarbon group, a group Ar or a $C_{1\text{-}10}$ aliphatic hydrocarbon group substituted by one or more groups selected from Ar, OAr and SAr.

4,945,107

INSECT ATTRACTANT

Dawn C. Minetti, Wykoff, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 129,501, Dec. 7, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 267,246

Int. Cl.[5] **A01N** *43/08*

U.S. Cl. 514—473 **8 Claims**

1. A method for attracting cockroaches which comprises placing a composition containing an effective amount of 4-hydroxy-2,5-dimethyl-3(2H) furanone and an inert diluent is an area inhabited by cockroaches.

4,945,108

ANGUCYCLINONES FROM STREPTOMYCETES, A PROCESS FOR THE PREPARATION THEREOF, AND THE USE THEREOF

Susanne Grabley, Königstein/Taunus; Joachim Wink, Offenbach; Carlo Giani, Frankfurt; Gerhard Seibert, Darmstadt; Wolfgang Raether, Dreieich; Susanne Dobreff, and Axel Zeeck, both of Göttingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

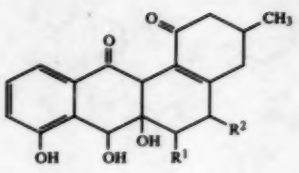
Filed Apr. 24, 1989, Ser. No. 342,061

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3813967

Int. Cl.[5] **C07D** *303/17, 69/00, 49/543;* **A61K** *31/335*

U.S. Cl. 514—475 **3 Claims**

1. A compound of the general formula I



I

in which, independently of one another,

R^1 can be hydroxyl and

R^2 can be hydrogen, or

R^1 and R^2 represent, together with the carrying carbon atoms, an oxirane ring,

as well as the (C_1toC_5)-acyloxy compounds derivatized on the hydroxyl groups indicated in formula I.

4,945,109

ESTER OF CARBAMIC ACID USEFUL AS A MICROBICIDE AND A PRESERVATIVE

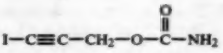
S. Rao Rayudu, Germantown, Tenn., assignor to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Aug. 24, 1988, Ser. No. 235,943

Int. Cl.[5] **A01N** *47/12*

U.S. Cl. 514—478 **18 Claims**

1. A compound having the formula:



4,945,110

MEMBRAME-FORMING VETERINARY ANTIBACTERIAL TEAT DIP

Kyle Brokken, Chaska, and Randolph S. Porubcan, Victoria, both of Minn., assignors to Quali Tech, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 62,278, Jun. 15, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 339,197

Int. Cl.[5] **A61K** *31/205, 31/195, 35/78*

U.S. Cl. 514—517 **35 Claims**

27. A viscosity stabilized, aqueous, topically adherent, self-supporting film-forming veterinary antibacterial composition comprising:

sodium lauryl sulfate in amount between about 4 to 8 weight percent of the total composition;

lactic acid, a food grade salt thereof, or admixtures thereof in an amount between 0.01 to 10 weight percent of the total composition;

a bactericidal food grade organic acid selected from benzoic acid, sorbic acid, citric acid, lower alkanoic acids, a food grade salt thereof, or admixtures thereof in an amount between 0.001 to 0.100 weight percent of the total composition;

a film forming food grade pectin or gum in an amount between about 0.02 to 2.5 weight percent of the total composition; and

a veterinarily acceptable water soluble emollient selected from short chain aliphatic polyols of up to six carbon atoms;

having a viscosity stabilized between 80 to 160 cps at 25 degrees C. and forming a topically adherent flexible protective antibacterial barrier film which adheres to the animal until removed by water washing.

4,945,111

FUNGICIDAL N,N'-DIACYLAMINALS

Winfried Lunkenheimer; Dieter Berg, both of Wuppertal, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

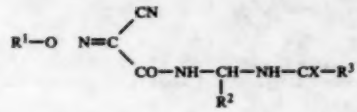
Filed Aug. 11, 1988, Ser. No. 231,121

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728277

Int. Cl.[5] A01N *37/34*; C07C *255/64*

U.S. Cl. 514—521 14 Claims

1. An N,N'-diacylaminal of the formula



in which

R^1 stands for alkyl which is unsubstituted or substituted by halogen, cyano, —$COOR^I$, —$CONR^{II}R^{III}$, —OR^{IV}, acyl, optionally substituted aryl or optionally substituted cycloalkyl; or

stands for optionally substituted alkenyl, optionally substituted alkinyl, optionally substituted cycloalkyl, or optionally substituted cycloalkenyl;

R^2 stands for hydrogen or alkyl which is unsubstituted or substituted by cyano, alkoxy, alkylthio, —$COOR^I$, acylamino, optionally substituted aryl or optionally substituted cycloalkyl; or

stands for optionally substituted alkenyl, optionally substituted alkinyl, optionally substituted cycloalkyl, optionally substituted cycloalkenyl, or optionally substituted aryl;

R^3 stands for hydrogen or for alkyl which is unsubstituted or substituted by halogen, alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, acyloxy, acylamino, cyano, —$COOR^I$, optionally substituted aryl or optionally substituted cycloalkyl; or

stands for optionally substituted alkenyl or optionally substituted alkinyl; or

stands for optionally bridged and/or fused, optionally substituted cycloalkyl or cycloalkenyl; or

stands for optionally fused, optionally substituted aryl; or for alkoxycarbonyl, —OR^4, —SR^4 or —NR^5R^6;

R^4 stands for alkyl which is unsubstituted or substituted by halogen, —OR^{IV}, —SR^{IV}, —$COOR^I$, —$CONR^{II}R^{III}$, —CN, —$NR^{II}R^{III}$, acyl, optionally substituted aryl, optionally substituted aryloxy, optionally substituted cycloalkyl, or optionally substituted cycloalkenyl; or

stands for optionally substituted alkenyl, optionally substituted alkinyl, optionally substituted cycloalkyl, or cycloalkenyl;

R^5 stands for hydrogen or for alkyl which is unsubstituted or substituted by halogen, cyano, —$COOR^I$, —$CONR^{II}R^{III}$, —$NR^{II}R^{III}$, —OR^{IV}, —$S(OR_n R^{IV}$, acyl, or optionally substituted aryl, optionally substituted cycloalkyl, or cycloalkenyl; or

stands for optionally substituted alkenyl, optionally substituted alkinyl, optionally substituted cycloalkyl, optionally substituted cycloalkenyl, or optionally substituted aryl; and

R^6 stands for hydrogen or for alkyl which is unsubstituted or substituted by halogen, cyano, —$COOR^I$, —$CONR^{II}R^{III}$, —$NR^{II}R^{III}$, —OR^{IV}, —$S(O)_n R^{IV}$, acyl, or optionally substituted aryl, optionally substituted cycloalkyl, or optionally substituted cycloalkenyl; or

stands for optionally substituted alkenyl, optionally substituted alkinyl, optionally substituted cycloalkyl, optionally substituted cycloalkenyl, or optionally substituted aryl, or the —OR^{IV} group;

R^I stands for hydrogen or alkyl which is unsubstituted or substituted by halogen, or optionally substituted aryl, optionally substituted cycloalkyl, or optionally substituted cycloalkenyl;

R^{II} and R^{III} are identical or different and stand for hydrogen or alkyl which is unsubstituted or substituted by halogen, —$COOR^{IV}$, —$CONR^{IV}R^{IV}$, optionally substituted aryl, optionally substituted cycloalkyl, or optionally substituted cycloalkenyl; or

stand for alkenyl, alkinyl, optionally substituted cycloalkyl, optionally substituted cycloalkenyl, or optionally substituted aryl;

R^{IV} stands for hydrogen, alkyl, aralkyl, or acyl;

n stands for the numbers 0, 1, or 2; and

X stands for oxygen or sulfur;

wherein

the term "optionally substituted aryl" stands for phenyl which is unsubstituted or substituted by one or more substituents independently selected from the group consisting of halogen, alkyl and alkoxy each having 1 to 4 carbon atoms, halogenoalkyl and halogenoalkoxy each having 1 to 2 different carbon atoms and 1 to 5 identical or different halogen atoms;

the term "optionally substituted aryloxy" stands for "optionally substituted aryl" bonded through oxygen;

the terms "optionally substituted cycloalkyl" and "optionally substituted cycloalkenyl" stand for cycloalkyl and cycloalkenyl which are each unsubstituted or substituted by alkyl having 1 to 4 carbon atoms;

the terms "optionally substituted alkenyl" and "optionally substituted alkinyl" stand for alkenyl or alkinyl which are each unsubstituted or substituted by phenyl which is unsubstituted or substituted by a substituent selected from the group consisting of halogen and alkyl having 1 to 4 carbon atoms;

the term "optionally bridged and/or fused optionally substituted cycloalkyl or cycloalkenyl" stands for cycloalkyl or cycloalkenyl each of which is (1) unbridged or bridged by methylene or ethylene, (2) unfused or fused to 1 or 2 benzene, cyclopentane, or cyclohexane rings, and (3) unsubstituted or substituted by one or more substituents independently selected from the group consisting of halogen, alkyl and alkoxy each having 1 to 4 carbon atoms, acyloxy and acylamino each having 2 to 5 carbon atoms, the oxo group, phenyl, hydroxycarbonyl, and alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy part; and

the term "optionally fused, optionally substituted aryl" stands for phenyl which is (1) unfused or fused to 1 to 2 benzene or cyclohexane rings and (2) unsubstituted or substituted by one or more substituents independently selected from the group consisting of halogen, hydroxyl, nitro, alkyl and alkoxy each having 1 to 4 carbon atoms, halogenoalkyl and halogenoalkoxy each having 1 to 2 carbon atoms and 2 to 5 identical or different halogen atoms, acylamino and acylalkylamino each having 2 to 5 carbon atoms in the acyl part and 1 to 4 carbon atoms in the alkyl part, hydroxycarbonyl and alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy part.

13. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a cmpound according to claim 1.

4,945,112

GUANIDINIUM COMPOUNDS AND FUNGICIDES CONTAINING THEM

Matthias Zipplies, Hirschberg; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

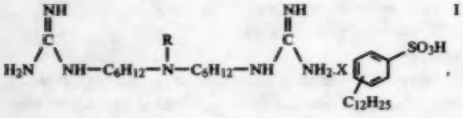
Filed Mar. 16, 1989, Ser. No. 324,422

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, 3812945

Int. Cl.[5] A01N *31/08, 33/04;* **C07C** *87/24, 143/34*

U.S. Cl. 514—555 **10 Claims**

1. Guanidiniumdodecylbenzene sulfonates of the formula I:



I

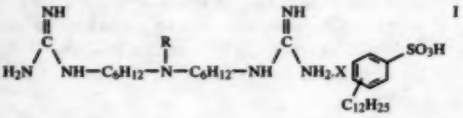
where

R is the group —H, —CH_3 or

and

X is 1, 2, 3 or 4.

3. A process for combating fungi, wherein the fungi, or the materials, plants, seeds or the soil are treated with an effective amount of a guanidiniumdodecylbenzene sulfonate of the formula I:



I

where

R is the group —H, —CH_3 or

and

X is 1, 2, 3 or 4.

4,945,113

HERBICIDAL SULFONAMIDE DERIVATIVES

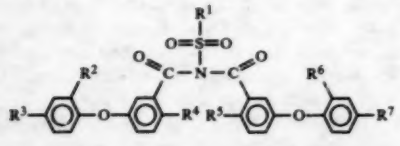
Mark A. Nowakowski, Haddam, and Allyn R. Bell, Cheshire, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Sep. 29, 1989, Ser. No. 414,977

Int. Cl.[5] A01N *41/06*

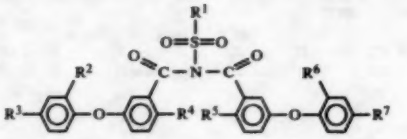
U.S. Cl. 514—605 **8 Claims**

1. A compound having the structural formula:



wherein R^1 is C_1–C_8 alkyl; R^2, R^3, R^6 and R^7 are each independently halogen or tri-halomethyl; and R^4 and R^5 are halogen, cyano or nitro.

5. A method for controlling the growth of undesirable plants comprising applying to the locus of such plants an herbicidally effective amount of a compound having the structural formula:



wherein R^1 is C_1–C_8 alkyl; R^2, R^3, R^6 and R^7 are each independently halogen or tri-halomethyl; and R^4 and R^5 are halogen, cyano or nitro.

4,945,114

THERAPEUTIC AGENTS CONTAINING ENANTIOMERS OF PROPAFENONE

Albrecht Franke, deceased, late of Wachenheim (by Renate E. Franke, Catharina Franke, legal representatives); Rainer Schlecker, Bissersheim; Josef Gries, Wachenheim; Gerda Von Philipsborn, Weinheim, and Liliane Unger, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 225,756

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725273

Int. Cl.[5] A61K *31/135*

U.S. Cl. 514—652 **7 Claims**

1. A method for the treatment of arrhythmias in an older patient or a patient suffering from hypotension and cardiac insufficiency, for whom β-blockers are contraindicated, by administering to said patient an effective amount of (R)-propafenone alone.

4,945,115

PROCESS FOR PREPARING FERULIC ACID

Yaguang Liu, 30 Seaman Ave., New York, N.Y. 10034

Division of Ser. No. 732,146, May 9, 1985, Pat. No. 4,687,761. This application Jun. 18, 1987, Ser. No. 63,433

Int. Cl.[5] A61K *31/05*

U.S. Cl. 514—731 **4 Claims**

1. A process for preparation of ferulic acid comprising:

a. extracting dried powder of a plant selected from the group consisting of Levisticum officinal Koch and Angelica sinenis Diels with boiling water to yield an extract;

b. concentrating the extract under reduced pressure;

c. adding 95% ethanol to said concentrated extract to form a solution;

d. filtering the solution and concentrating under reduced pressure the resulting filtrate to a syrup;

e. drying said syrup in the presence of silica gel to form crude ferulic acid;

f. extracting said crude ferulic acid with 95% ethanol to form an extract;

g. concentrating said ethanol extract under reduced pressure to yield a residue;

h. dissolving said residue in water;

i. passing the water solution through a polyamide column to fractionate the ferulic acid; and

j. extracting the fractionated ferulic acid with benzol-acetone;

k. distilling the resulting extract under reduced pressure; and

l. crystallizing ferulic acid therefrom.

4,945,116

FISCHER-TROPSCH SYNTHESIS PROCESS EMPLOYING A MODERATED RUTHENIUM CATALYST

Hayim Abrevaya, Wilmette, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 29, 1988, Ser. No. 290,398
Int. Cl.[5] C07C *1/04*
U.S. Cl. 518—715 14 Claims

1. A process for producing C_3-plus hydrocarbons from carbon monoxide which comprises contracting a feed stream comprising hydrogen and carbon monoxide with a solid catalyst in a reaction zone maintained at conversion-promoting conditions and producing an effluent stream comprising C_3-plus hydrocarbons, with the catalyst comprising (i) an inorganic oxide support; (ii) about 0.3–6.0 wt. percent ruthenium present as particles of about 40–60 Angstroms and (iii) about 0.1–5 wt. % of a modifier component chosen from the group consisting of aluminum, silicon, lead, arsenic, and bismuth.

4,945,117

LIQUID POLYISOCYANATE COMPOSITIONS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE FOR THE PREPARATION OF FLEXIBLE POLYURETHANE FOAMS

Peter Gansen; Klaus-Dieter Wolf, and Klaus Seel, all of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed May 19, 1989, Ser. No. 354,649
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1988, 3818769
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—99 26 Claims

1. A urethane-modified polyisocyanate composition having an NCO content of about 15 to about 30% by weight that is liquid at room temperature, wherein said polyisocyanate composition is obtained by reaction of

(a1) a polyisocyanate or polyisocyanate mixture of the diphenylmethane series containing from 50 to 100% by weight diisocyanatodiphenylmethane isomers,

with

(b) a substoichiometric quantity of a polyether polyol composition, said composition being (i) a polyether polyol having a hydroxyl equivalent weight of about 500 to about 3000 and a hydroxyl functionality greater than about 4 or (ii) a mixture of two or more polyether polyols having an average hydroxyl equivalent weight of about 500 to about 3000 and an average hydroxyl functionality greater than about 4.

4,945,118

(HALONEOCARBYL-SUBSTITUTED)ALIPHATIC OR OXYALIPHATIC)(HALOGENATED ALIPHATIC OR OXYALIPHATIC)-PHOSPHORATES WITH POLYURETHANES

Chester E. Pawloski, Bay City; Donna J. Fielding, and David J. Wampfler, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 895,541, Aug. 11, 1986, Pat. No. 4,851,559. This application May 3, 1989, Ser. No. 347,097
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—107 12 Claims

1. A method for satisfying a production characteristic of a flame-retardant polyurethane comprising incorporating a (haloneocarbyl-substituted) (aliphatic or oxyaliphatic)-(halogenated aliphatic or oxyaliphatic)phosphorate into a polyurethane whereby said production characteristic is satisfied.

4,945,119

FOAMING SYSTEM FOR RIGID URETHANE AND ISOCYANURATE FOAMS

Guide F. Smits, Wijengem, Belgium, and Henri J. M. Grünbauer, Oostburg, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1989, Ser. No. 350,184
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—131 29 Claims

1. A process for preparing a rigid closed-celled polyisocyanate-based foam by reacting at least one organic polyisocyanate with at least one active hydrogen-containing compound in the presence of a blowing agent composition characterized in that the composition comprises:

(a) from about 40 to about 95 mole percent based on components (a) and (b) of at least one organic compound having a boiling point of at least about 283K, and

(b) from about 5 to about 60 mole percent based on components (a) and (b) of at least one organic compound having a boiling point less than or equal to about 266K,

and wherein the ratio of the said boiling point of a component (a) to a component (b) is from about 1.06:1 to about 1.20:1 and wherein the said composition is substantially free of any organic compound having a boiling point of at least 338K.

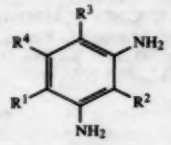
4,945,120

PROCESS FOR THE PRODUCTION OF POLYURETHANE FOAMS USING STERICALLY HINDERED AROMATIC DIAMINES

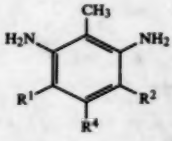
Richard Kopp; Günter Oertel; Eckehard Weigand, and Rolf Wiedermann, all of Bayer AG, D 5090, Leverkusen, Fed. Rep. of Germany

Filed May 23, 1989, Ser. No. 355,943
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433979
Int. Cl.[5] C08G *18/00, 18/14*
U.S. Cl. 521—163 13 Claims

1. In a process for the production of a free-rise polyurethane foam by reacting (i) an organic polyisocyanate and (ii) a compound containing at least two isocyanate-reactive hydrogen atoms and having a molecular weight of from 400 to 10,000, in the presence of (iii) water and/or an organic blowing agent, and allowing the reaction mixture to foam, the improvement wherein a sterically hindered aromatic diamine corresponding to the formula(e)



and/or



in which

R^1 R^2 may be the same or different and represent C_1–C_4 alkyl and R^3 and R^4 may again be the same or different and represent H or CH_3, is added to said reaction mixture.

4,945,121

THERMOSETTING DYED LATEX COLORANT DISPERSIONS

Fortunato J. Micale, Bethlehem, and Garry T. Gwozdz, Nazareth, both of Pa., assignors to Koh-I-NOOR Radiograph, Inc., Bloomsbury, N.J.

Filed Aug. 18, 1987, Ser. No. 86,741

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[5] C08L 63/00; C08K 3/20

U.S. Cl. 523—339 13 Claims

1. In a process for producing a thermosetting colorant comprising a stable aqueous suspension of nanoparticles of crosslinked thermosetting polymer, wherein water-insoluble dye molecules are intermixed in a polymer matrix, according to a process comprising the steps of:

A. Mixing together an organic solvent, a polymer comprising an epoxy resin that is soluble in said solvent but substantially insoluble in water and dye which is soluble in said solvent and substantially insoluble in water to form a homogeneous mixture, wherein said solvent is characterized by a vapor pressure higher than water and said mixing is continued until said dye and polymer are molecularly intermixed to form a dyed polymer that substantially is dissolved within said solvent; and

B. Dispersing by adding said solvent/polymer/dye solution to water, in a concentration range of 1.0 percent to 50.0 percent, by weight, and agitating until an emulsion results wherein droplets of solvent/polymer/dye less than 10 microns in diameter comprise a discontinuous phase in water as the continuous phase, wherein said dispersing step is done under conditions where interfacial tension between the organic solvent and the water is less than approximately 20 dynes/cm; and

C. Removing substantially all of said solvent to define a resulting fluid comprising an aqueous suspension of dyed polymer nanoparticles;

the improvement which comprises the step of combining dyed polymer with a curing agent by contacting curing agent in a liquid phase with polymer, before or after said dispersing step, to create a final fluid adapted to be crosslinked selectively upon applying heat to raise the temperature of the dyed polymer and curing agent combination above its glass transition temperature.

4,945,122

ACRYLIC RESIN COMPOSITION

Bill R. Edwards, 10311 Merton St., Wichita, Kans. 67209

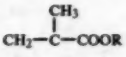
Filed Jul. 27, 1989, Ser. No. 386,501

Int. Cl.[5] C08K 5/42; C08F 2/38

U.S. Cl. 524—166 24 Claims

1. A polymerization syrup having a improved shelf life, the polymerization syrup consisting essentially of:

from about 300 to about 1000 parts by volume of an acrylic monomer represented by the formula



wherein R is an alkyl moiety containing 1 to about 18 carbon atoms;

from about 0.1 to about 1 parts by volume 2,2-bis(allyloxymethyl)-butan-1-ol;

from about 0.5 to about 5 parts by volume of a mercaptan; and

from about 0.3 to about 40 parts by volume of a crosslinking agent compatible with the acrylic monomer.

4,945,123

COATING COMPOSITION FOR TREATING SURFACE OF HIGH MOLECULAR ELASTIC MATERIAL

Masayoshi Miyama, and Hiroki Komori, both of Chiba, Japan, assignors to Kinugawa Rubber Industrial Co., Ltd., Chiba, Japan

Filed Jan. 31, 1989, Ser. No. 304,816

Claims priority, application Japan, Feb. 2, 1988, 63-22483

Int. Cl.[5] G08J 7/02

U.S. Cl. 524—269 4 Claims

1. A coating composition for treating a surface of a high molecular elastic material, comprising:

(a) a urethane coating material;

(b) a silicone oil;

(c) a fluorocarbon resin powder; and

(d) a polyethylene powder, wherein the silicone oil, fluorocarbon resin powder, and polyethylene powder are mixed and blended with the urethane coating material to form a surface treating material.

4. A coating composition for treating a surface of a weatherstrip member applicable to an automotive vehicle, comprising:

(a) a urethane coating material;

(b) a silicone oil;

(c) a fluorocarbon resin powder; and

(d) a polyethylene powder, wherein the silicone oil, fluorocarbon resin powder, and polyethylene powder are mixed and blended with the urethane coating material.

4,945,124

IMPACT RESISTANT POLYAMIDE MOULDING COMPOUNDS MODIFIED WITH SILICONE GRAFT RUBBERS

Uwe Westeppe, Remscheid; Christian Lindner, Cologne; Karl-Erwin Piejko, Bergisch-Gladbach, and Josef Merten, Korschenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 9, 1989, Ser. No. 294,216

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801537

Int. Cl.[5] C08L 51/08

U.S. Cl. 525—63 13 Claims

1. A thermoplastic moulding composition comprising

(I) 40–99 parts by weight, of a partially crystalline or amorphous polyamide and

(II) 60–1 parts by weight of a graft rubber, having

(a) a core of 0.1 to 90 parts by weight of a cross-linked silicone rubber, wherein the silicone rubber core contains R_2SiO with from 0 to 10 molar units of the formula $RSiO_{3/2}$, from 0 to 1.5 molar units of the formula $R_3SiO_{1/2}$ and from 0 to 3 molar units of the formula SiO_2 per 100 molar units of the formula R_2SiO, wherein R is a saturated hydrocarbon group having 1–18 carbon atoms, phenyl, alkoxy, vinyl or γ-mercaptopropyl;

(b) a first shell of 99.9 to 10 parts by weight of a cross-linked acrylate rubber, graft polymerized on (a), which comprises polymerized alkyl acrylate esters and

(c) a second shell of resin forming graft polymerized vinyl monomers or mixtures of monomers which are α-methylstyrene, styrene, acrylonitrile, alkyl(meth)acrylates or maleic acid derivatives or vinyl acetate or mixtures thereof;

the ratio by weight of the sum of (a)+(b):(c) being in the range of from 7 : 15 to 19 : 3.

4,945,125

PROCESS OF PRODUCING A FIBRILLATED SEMI-INTERPENETRATING POLYMER NETWORK OF POLYTETRAFLUOROETHYLENE AND SILICONE ELASTOMER AND SHAPED PRODUCTS THEREOF

Joseph A. Dillon, and Mark E. Dillon, both of Huntingdon Valley, Pa., assignors to Tetratec Corporation, Feasterville, Pa.

Filed Jan. 5, 1987, Ser. No. 389
Int. Cl.[5] C08L 27/18; D01D 5/16; D01F 1/02
U.S. Cl. 527—427 5 Claims

1. A process for producing a semi-interpenetrating polymer network of polytetrafluoroethylene and silicone elastomers which comprises the steps of (1) intimately blending a mixture of a major amount of unsintered and unfibrillated particulate polytetrafluoroethylene dispersion resin and minor amounts of (A) a hydrocarbon liquid and (B) an addition curable silicone composition consisting essentially of a polydiorganosiloxane having alkenyl unsaturation, an organohydrogenpolysiloxane crosslinking agent, a catalyst for promoting crosslinking of said polysiloxane, and an inhibitor for the catalytic reaction; (2) forming said blend into an extrudable shape; (3) biaxially extruding said blend through a die into a shaped extrudate product having a randomly fibrillated structure; (4) evaporating said hydrocarbon liquid, and activating said catalyst so as to generate a cured silicone elastomer and polytetrafluoroethylene semi-interpenetrating polymer network comprising said fibrillated extrudate structure.

4,945,126

METHODS OF IMPROVING FRICTION AND WEAR PROPERTIES OF POLYMER SYSTEMS

Jane M. Crosby, Wilmington, Del., and John E. Theberge, King of Prussia, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 465,968, Feb. 14, 1983, abandoned, and Ser. No. 774,170, Sep. 9, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 10,032
Int. Cl.[5] C08L 27/18, 23/04, 23/10
U.S. Cl. 524—507 19 Claims

1. In a method of making a plastic-plastic or plastic-metal wear system wherein the surface of a polymer composite bears against another surface causing friction and wear of the polymer composite, the improvement comprising improving the wear resistance and lowering the coefficients of friction of said composite by melt mixing of a polymer matrix and about 1 to 30 weight percent, based on the total composite, of a lubricant comprising a blend of about 2 to 98 weight percent polyolefin having a weight average molecular weight of about 50,000 to about 500,000 and about 98 to 2 weight percent finely divided polytetrafluoroethylene, to form said composite in which said polyolefin does not remain as discrete, identifiable particles after melt mixing with said polymer matrix, and said matrix is not the same as the polyolefin in the lubricant.

4,945,127

POLYMER COMPOSITION, ITS HEAT-RESISTANT, SHAPE MEMORY FORMED PRODUCT AND METHOD OF PRODUCING SAME

Seiji Kagawa; Hideaki Toda, and Shinichiro Nomura, all of Yokohama, Japan, assignors to Tonen Sekiyukagaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1988, Ser. No. 289,100
Claims priority, application Japan, Dec. 28, 1987, 62-333890; Mar. 10, 1988, 63-56695; Jun. 17, 1988, 63-149739
Int. Cl.[5] C08L 31/04, 23/16
U.S. Cl. 524—524 7 Claims

1. A shape memory formed product made of a polymer composition comprising 40–70 weight % of a thermoplastic elastomer containing a repeating unit derived from ethylene and a repeating unit derived from propylene, and 60–30 weight % of an ethylene-vinyl acetate copolymer containing 7.5 weight % or more of a vinyl acetate repeating unit, wherein said polymer composition is prepared by blending at a temperature of 160° C. or less, then molded at a temperature of 180° C. or less to produce a formed product, then which is deformed at such a temperature that crystal phases wherein are melted and then cooled while being kept in a deformed shape so as to obtain a shape memory formed product.

4,945,128

DISPERSIONS OF CROSSLINKED POLYMER MICRO-PARTICLES IN AQUEOUS MEDIA, A PROCESS FOR THE PREPARATION OF THESE DISPERSIONS, AND COATING COMPOSITIONS CONTAINING THESE DISPERSIONS

Hans-Dieter Hille, Bergisch-Gladbach; Horst Muller, Cologne, and Arnold Dobbelstein, Münster, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben Aktiengesellschaft, Münster, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 267,126
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606512
Int. Cl.[5] C08L 75/06; C08G 18/42
U.S. Cl. 524—591 18 Claims

1. A dispersion of crosslinked polymer micro-particles in an aqueous medium, wherein the dispersion has been prepared:

(1) by dispersing a mixture of the components (A) and (B) in an aqueous medium, the component (A) being composed of one or more polyester-polyols containing at least 2 hydroxyl groups, and the component (B) being composed of one or more polyisocyanate compounds, and the component (A) having available a number of ionic groups sufficient to form a stable dispersion, and at least one part of the components (A) and/or (B) containing more than 2 hydroxyl or isocyanate, respectively, groups per molecule and

(2) by subsequently heating the dispersion thus obtained to a temperature sufficiently high for the components (A) and (B) to react to form crosslinked polymer micro-particles.

4,945,129

POLYAMIDE COMPOSITIONS WITH HIGH IMPACT STRENGTH AT LOW TEMPERATURES

Charles D. Mason, Chatham Township, Morris County, N.J.; John A. Young, Midlothian, Va.; John C. Haylock, Dennysville, Me., and Ian C. Twilley, Chester, Va., assignors to Allied-Signal Inc., Morristownship, N.J.

Continuation of Ser. No. 90,184, Aug. 27, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 303,038
Int. Cl.[5] C08L 77/00
U.S. Cl. 525—66 13 Claims

1. A melt blended polyamide composition comprising:

from 0.5 to 95% by weight of the total polyamide of polyamide molecules having 60 to 97 mole percent of their end groups as amine groups;

from 5 to 99.5% by weight of the total polyamide of at least one additional polyamide selected from the group consisting of polyamides formed from diamines and dibasic acids and having balanced end groups, and polyamides comprising molecules having end groups formed by reaction with monoamines, or having end groups which are more than 50 mole percent acid groups; and

from 2 to 50 percent by weight of the total polymer of a reactive copolymer comprising a copolymer consisting essentially of ethylene and a monomer elected from the group consisting of an alpha-olefin having 3 to 8 carbon atoms, the reactive copolymer having an average of at least two reactive moieties per copolymer molecule wherein each of said reactive moieties is a dicarboxylic acid or derivative thereof and said amine groups of said polyamide and said at least two reactive moieties of said copolymer react together during melt blending.

4,945,130

MOLDING COMPOSITIONS OF POLYCARBONATE, THERMOTROPIC POLYMER, GRAFT POLYMER AND FLUORINATED POLYOLEFIN

Joachim Genz; Hans-Rudolf Dicke, both of Krefeld; Ulrich Grigo, Kempen, and Werner Nouvert e, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 206,820, Jun. 15, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 408,473

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721239

Int. Cl.[5] C08L *69/00, 67/00*

U.S. Cl. 525—67 6 Claims

1. Thermoplastic molding compositions of

A. 1 to 98.87% by weight of an aromatic polycarbonate,

B. 1 to 86% by weight of a thermotropic polymer,

C. 0.05 to 5% by weight of a fluorinated polyolefin and

D. 0.08 to 8% by weight of an elastomeric graft polymer,

the percentages being based in each case on the sum of components A to D.

4,945,131

CONTROL OF SURFACE GLOSS BY VARIATION OF HIPS RUBBER SWELL INDEX IN POLYPHENYLENE ETHER COMPOSITION

Sai-Pei Ting, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Jan. 10, 1986, Ser. No. 817,903

Int. Cl.[5] C08L *7/12*

U.S. Cl. 525—68 9 Claims

1. A method of controlling the surface gloss of a molded composition of (a) a polyphenylene ether resin and (b) a rubber modified, high impact polystyrene comprising regulating the rubber swell index of the rubber in component (b) from about 9.3 to about 17.9 to vary the surface gloss after molding from about 37 to about 58 in inverse proportion to the swell index.

4,945,132

CROSSLINKED POLYMER INTERDISPERSIONS, RELATED COMPOSITIONS AND METHOD OF MAKING SAME

Edward V. Wilkus, 27 Woodmere Dr., and Alexander F. Wu, 33 Melrose Ave., both of, Trumbull, Conn. 06611

Division of Ser. No. 908,966, Aug. 14, 1986, Pat. No. 4,781,979, and Ser. No. 679,144, Dec. 6, 1984, Pat. No. 4,758,627. This application Apr. 18, 1988, Ser. No. 182,886

Int. Cl.[5] C08L *23/26, 25/10, 27/18, 27/22*

U.S. Cl. 525—194 9 Claims

1. A composition of matter comprising a chemically crosslinkable interdispersion of a first polymer and a second polymer, said interdispersion (i) being at least partially formed with at least one polytetrafluoroethylene interdispersing agent and (ii) containing a peroxide crosslinking agent;

wherein the first polymer is selected from the group consisting of:

low density polyethylene,
high density polyethylene,
linear low density polyethylene,
ethylene/propylene copolymer,
polypropylene
ethylene/propylene/diene terpolymer,
ethylene/vinyl acetate copolymer,
ethylene/ethyl acrylate copolymer,
chlorinated polyethylene, and
chlorosulfonated polyethylene;

the second polymer is selected from the group consisting of:

polyvinyl chloride,
styrene/butadiene rubber, polychloroprene,
polymethyl methacrylate, and
polypropylene;

and, in each interdispersion, the first polymer is different from the second polymer.

4,945,133

OXIDATION OF HALOGENATED POLYMERS AND ANTICAKING HALOGENATED POLYMERS

Donald W. Pennington, and Joseph L. Allison, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 101,615, Sep. 26, 1987. This application Nov. 22, 1988, Ser. No. 274,877

Int. Cl.[5] C08F *8/34*

U.S. Cl. 525—261 11 Claims

1. A process of preparing a graft copolymer comprising steps of

(a) forming an admixture of (1) an acidic oxidizing agent selected from the group consisting of peroxydisulfuric acid, and its alkali and alkaline earth metal salts and (2) a suspension of a particulate halogenated polymer selected from the group consisting of halogenated olefin polymers and halogenated rubbers in a polar liquid;

(b) heating the admixture to a temperature sufficient to initiate reaction between the polymer and the oxidizing agent; and

(c) continuing the reaction until an oxidized polymer having a preselected extent of oxidation is obtained

(d) grafting to the oxidized polymer at least one addition polymerizable compound.

4,945,134

INTERPOLYMERS HAVING COLOR AND HEAT STABILITY AS WELL AS OXYGEN BARRIER PROPERTIES

Karen L. Wallace, and Dolk Lee, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1988, Ser. No. 282,654

Int. Cl.[5] C08F *214/08, 111/08*

U.S. Cl. 525—301 7 Claims

1. An emulsion polymerized interpolymer having two phases consisting essentially of: (a) a first phase of an effective amount of at least one ethylenically unsaturated monomer and (b) a second phase of an effective amount of vinylidene chloride monomer and at least one ethylenically unsaturated comonomer wherein the first and second phases are miscible with each other and wherein the ethylenically unsaturated monomer of the second phase is selected from the group consisting of: vinyl chloride, alkyl acrylates, alkyl methacrylates, acrylic acid, methacrylic acid, and itaconic acid and wherein the ethylenically unsaturated monomer of the first phase is selected from the group consisting of: methylmethacrylate; alkyl acrylates; and alkyl methacrylate monomer mixtures and wherein the effective amount of the ethylenically unsaturated monomer present in the first phase is from about 95 to about 5 weight percent based on total monomer present in the total interpolymer particle and wherein the effective amount of the ethylenically unsaturated comonomer present in the second phase is from about 5 to about 25 weight percent based on total monomer present in the second phase.

4,945,135

RING OPENING METATHESIS POLYMERIZATION OF STRAINED CYCLIC ETHERS

Robert H. Grubbs, South Pasadena, and Bruce M. Novak, El Sobrante, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 371,982, Jun. 22, 1989, Pat. No. 4,883,851, which is a continuation-in-part of Ser. No. 223,406, Jul. 25, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,888

Int. Cl.[5] C08C *19/02*

U.S. Cl. 525—338 3 Claims

1. A process of forming fully saturated polymers comprising

hydrogenating polymers obtained from the polymerization of 7-oxanorbornene and its derivatives.

4,945,136

PROCESS FOR THE PREPARATION OF CARBOXYLATED PROPYLENE POLYMERS

Anne C. Udding, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 184,644, Apr. 22, 1988, Pat. No. 4,849,477. This application Feb. 15, 1989, Ser. No. 310,165

Claims priority, application United Kingdom, Nov. 27, 1987, 8727775

Int. Cl.[5] C08F 8/34

U.S. Cl. 525—351 **5 Claims**

1. A process for the preparation of carboxylated propylene homo- and copolymers which comprises the reaction of a thermoplastic propylene homo- or copolymer with between 0.1 and 6.0% of an azidosulfonylbenzoic acid by mechanically mixing for not more than about 30 minutes said polymer and said acid at a temperature of between 200° C. and 220° C. in the substantial absence of a free-radical initiator and wherein the reaction components are blended at a temperature from 160° C. to 170° C. prior to the reaction step.

4,945,137

BINDER COMBINATIONS AND A PROCESS FOR THE PRODUCTION OF FLAT MATERIALS

Walter Schäfer, Leichlingen; Hans Rudolph, Krefeld; Rolf Dhein, Krefeld; Hanns-Peter Müller, Krefeld; Michael Sonntag, Odenthal; Christian Wamprecht, Neuss; Harald Blum, Wachtendonk, and Walter Krauss, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Oct. 2, 1989, Ser. No. 415,863

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834750

Int. Cl.[5] C08F 8/30

U.S. Cl. 525—375 **6 Claims**

1. In improved binder combinations of

(a) polymers containing intramolecular carboxylic anhydride groups and having an average molecular weight of from 500 to 25,000 and

(b) organic compounds containing 4,5-dihydrooxazole groups in a quantity corresponding to an equivalent ratio of carboxylic anhydride groups to 4,5-dihydrooxazole groups of from 0.5:1 to 2:1,

the improvement comprises said combinations having a content of from 0.005 to 6% by weight, based on the weight of components (a) and (b), of ammonia, a primary amine or secondary amine.

4,945,138

STYRYLAZA VINYL ESTERS

Robert E. Hefner, Jr., and John W. Robinson, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 101,047, Sep. 25, 1987, Pat. No. 4,851,483. This application Feb. 28, 1989, Ser. No. 317,267

Int. Cl.[5] C08G 8/10

U.S. Cl. 525—502 **2 Claims**

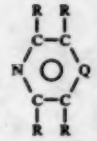
1. A polymerizable mixture comprising

(I) the vinyl ester resin composition prepared by reacting

(A) a polyepoxide of a thermostable hydroxystyrylaza compound wherein said hydroxystyrylaza compound is prepared by reacting

(1) one or more mono hydroxy aromatic aldehydes wherein the ortho and para positions from the hydroxy group having no aldehyde groups are substituted by groups inert to condensation with alkyl azines, and

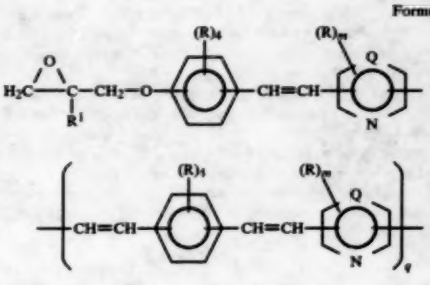
(2) one or more methylated azine compounds having the formula

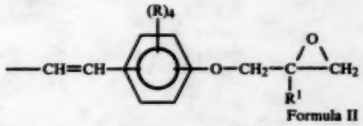


where Q is N or C-R, and each R is independently hydrogen, a halogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to 20 carbon atoms, nitro, nitroso, nitrile,

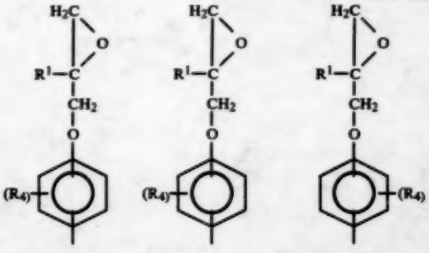
allyl or a methallyl group; E is a hydrocarbyl group having from 1 to about 20 carbon atoms with the proviso that the total number of methyl groups (R=—CH_3) substituted on the ring is in the range from 2–4 and wherein said polyepoxy compound has one of the following formulas

Formula I





Formula II



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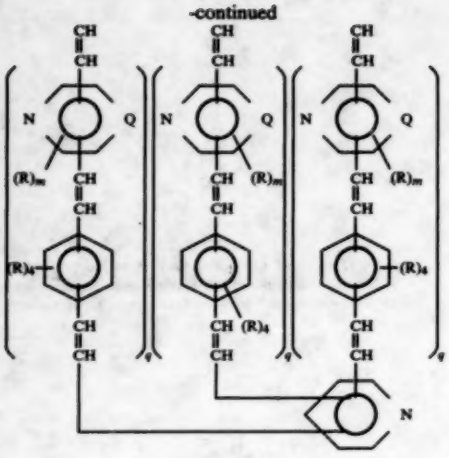


wherein Q is independently C-R or N and when Q is C-R, m is 3, when Q is N, m is 2; each R is independently hydrogen, a halogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, nitro, nitroso, nitrile,

allyl or a methallyl group; E is a hydrocarbyl group having from 1 to about 20 carbon atoms with the proviso that the R groups ortho or para to the glycidyl ether linkage may not be hydrogen; q has a value from 0 to about 50; and R^1 is independently hydrogen or a hydrocarbyl group having from 1 to about 4 carbon atoms with

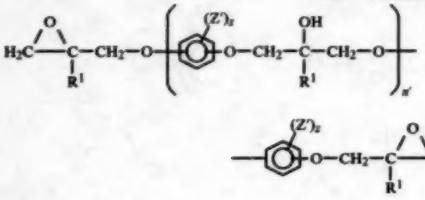
(B) about 0.75 to about 1.0 mole of one or more mono-olefinically unsaturated monocarboxylic acids per mole of epoxide; and

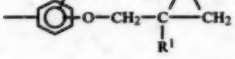
(II) one or more members of the group consisting of

(A) ethylenically unsaturated monomers,

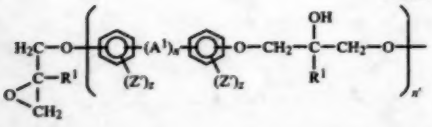
(B) vinyl ester compositions derived from (I) one or more epoxy resins represented by the following formulas VIII, IX, X or XI

Formula VIII





Formula IX



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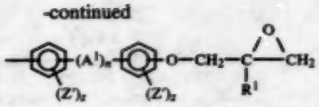
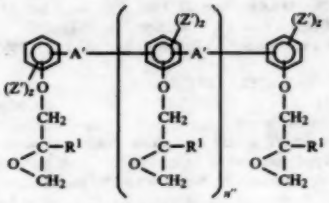
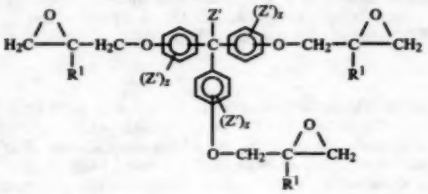


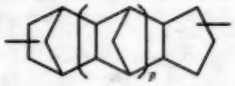
Formula X



Formula XI



wherein A^1 is independently an alkylene group having from 1 to about 10 carbon atoms, —O—, —CO—, —S—, —S—S—, —SO—, —SO_2—; each A' is independently an alkylene group having from 1 to about 6 carbon atoms or a



group; Z' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms, a halogen, or a phenyl group; each R^1 is independently hydrogen or a hydrocarbyl group having from 1 to about 4 carbon atoms; n has a value of zero or 1; n' has a value of from about zero to about 30; n'' has a value from about 0.001 to about 6; p has a value from zero to about 10; z has a value of 4; and z' has a value of 3; and (2) at least one mono-olefinically unsaturated monocarboxylic acid,

(C) styryl pyridines, and/or their prepolymers or polymers,

(D) vinyl styryl pyridines, and/or their prepolymers or polymers,

(E) alkenylphenyl cyanates,

(F) dicyanates and/or polycyanates,

(G) bismaleimides and/or polymaleimides,

(H) epoxy resins,

(I) alkenylphenol capped styryl pyridines and/or their prepolymers or polymers,

(J) allyl styryl pyridines and/or their prepolymers or polymers,

(K) styryl pyridine cyanates and/or their prepolmers or polymers,

(L) furan capped styryl pyridines and/or their prepolymers or polymers, and

(M) alkenylphenyl glycidyl ether capped hydroxystyryl pyridines and/or their prepolymers or polymers.

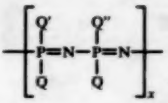
4,945,139

PROCESS FOR SURFACE TREATING PHOSPHONITRILIC FLUOROELASTOMERS

Charles H. Kolich; W. Dirk Klobucar, and Jeffrey T. Books, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 24, 1989, Ser. No. 383,642
Int. Cl.[5] C08G 79/02
U.S. Cl. 525—538 12 Claims

1. A process for treating a cured phosphonitrilic fluoroelastomer of the formula



where x is an integer of from about 3 to about 50,000, Q and Q′ are the same or different and are fluoroalkoxy of the formula $-OCH_2(CF_2)_mCF_2Z$ where m is an integer from 0 to 20 and Z is hydrogen or fluorine and Q″ is a group having some olefinic unsaturation comprising treating the surface of said cured phosphonitrilic fluoroelastomer with a solution of an alkali metal fluoroalkoxide of the formula MOC_nF where M is an alkali metal and C_nF is a fluorocarbon moiety represented by the formula $-(CH_2)_y(CF_2)_nCF_3$ where y is 1 or 2 and n is an integer from 1 to 20; replacing some of said Q and Q′, where Q and Q′ are as previously defined with said moiety OC_nF; whereby the resulting cured phosphonitrilic fluoroelastomer possesses a decreased number of fluoroalkoxide groups where Z is hydrogen.

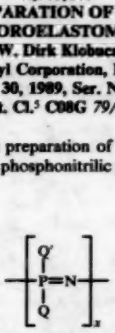
4,945,140

PROCESS FOR PREPARATION OF PHOSPHONITRILIC FLUOROELASTOMERS

Charles H. Kolich, and W. Dirk Klobucar, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 30, 1989, Ser. No. 373,449
Int. Cl.[5] C08G 79/02
U.S. Cl. 525—538 9 Claims

1. A process for the preparation of phosphonitrilic fluoroelastomer by treating a phosphonitrilic polymer of the formula



where x is an integer of from about 3 to about 50,000, Q and Q′ are the same or different and are fluoroalkoxy of the formula $-O(CH_2)_y(CF_2)_mCF_2Z$ where y is 1 or 2, m is an integer from 0 to 20 and Z is hydrogen or fluorine with a ligand replacement mixture of i) an alkali metal fluoroalkoxide of the formula MOC_nF where M is an alkali metal and C_nF is a fluorocarbon moiety represented by the formula $-(CH_2)_y(CF_2)_nCF_3$ where y is 1 or 2 and n is an integer from 1 to 20 and ii) a fluoroalcohol of the formula HOC_nF where C_nF is the same or different than C_nF where y and n are as previously defined; replacing some of said Q and Q′, where Q and Q′ are as previously defined with C_nF and C_nF; whereby the resulting phosphonitrilic fluoroelastomer possesses a decreased number of fluoroalkoxide groups where Z is hydrogen.

4,945,141

RING OPENING METATHESIS POLYMERIZATION OF STRAINED CYCLIC ETHERS

Robert H. Grubbs, South Pasadena, and Bruce M. Novak, El Sobrante, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 371,982, Jun. 22, 1989, Pat. No. 4,883,851, which is a continuation-in-part of Ser. No. 223,406, Jul. 25, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,884
Int. Cl.[5] C08F 4/42
U.S. Cl. 526—90 2 Claims

1. A process for carrying out emulsion catalysis comprising contacting oxanorbornene or its derivatives with a catalyst selected from the group consisting of $RuCl_3$ (hydrate), $OsCl_3$ (hydrate), K_2RuCl_5 (hydrate), $[Ru(NH_3)_5Cl]Cl_2$, $[Ru(NH_3)_5(H_2O)](CH_3CO_2)_2$, $Ru_3O_2(NH_3)_{14}Cl_6$, $RuBr_3$ (hydrate), $Ru(H_2O)_6(Ts)_2$ (Ts=tosylate), cis-tetrakis(dimethylsulfoxide)dichlororuthenium (II), trans-tetrakis(dimethylsulfoxide)dibromoruthenium (II), and tetrakis(tetrahydrothiophene)dichlororuthenium (II).

4,945,142

COMPOSITION AND PROCESS FOR FRICTION LOSS REDUCTION

Donald E. Gessell, Friendswood, Tex., and Donald P. Hosman, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 14, 1988, Ser. No. 271,552
Int. Cl.[5] C08F 4/64, 4/68
U.S. Cl. 526—128 3 Claims

1. A method of preparing an ultra-high molecular weight hydrocarbon soluble polymer having an inherent viscosity greater than 12.0, comprising contacting under polymerization conditioned an ethylenically unsaturated monomer with a catalyst prepared by contacting, under an inert atmosphere,

(1) a transition metal halide of the general formula MX_t wherein M is titanium or vanadium, and t is equal to 2.5 to 4.0, and x is a halogen with

(2) a first electron donor selected from the group consisting of ethers, amines, esters, phosphines, piperdines, phosphites, phosphates, pyridines, sulfides and mixtures of these, and allowing the components to react for a period of at least 3 minutes, then contacting the reaction product of (1) and (2) with

(3) a co-catalyst comprising an organoaluminum or organoaluminum halide of the formula AlR_nX_{3-n}, wherein R is a hydrocarbon radical containing from 1 to 20 carbon atoms, X is at least one constituent selected from the group consisting of halogen, siloxide or alkoxide, and n is less than 3, and

(4) a polysiloxane of the general formula

$$\left[R_aH_bSiO\,\frac{4-(a+b)}{2}\right]_c,$$

wherein R is hydrogen, an alkyl group containing from 1 to 20 carbon atoms, aralkyl or alkaryl group containing from 6 to 20 carbon atoms, a and b are greater than 0, and where the sum (a+b) does not exceed 3.0, and c is 2 or more, and wherein the ethylenically unsaturated monomer is at least 80 percent alpha-olefins, and wherein the resultant polymer formed is formed from alpha-olefins containing at least 4 carbon atoms.

4,945,143

ALLYLOXY ACTIVATED COATING COMPOSITIONS

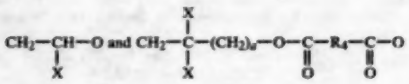
Christopher J. Hardiman, Belchertown, and Gary R. Bowers, Westfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 286,012, Dec. 19, 1988, Pat. No. 4,861,668, which is a division of Ser. No. 946,742, Dec. 24, 1986, Pat. No. 4,816,535. This application Jul. 21, 1989, Ser. No. 383,114
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[5] C08F 4/06
U.S. Cl. 526—206 4 Claims

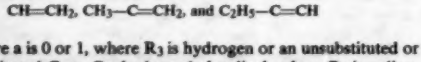
1. A coating composition comprising
(a) a free-radical polymerizable compound,
(b) an allyloxy compound,
(c) a metal drier catalyst,
(d) a peroxide free radical initiator, and
(e) a strong fugitive acid as a catalyst stabilizer;
wherein said allyloxy compound is selected from the group represented by the formulae:

$$R_2((E)_mR_3)_n,\ R_5(OCH_2Y)_p,\ R_6(CH(OCH_2Y)_2)_q \text{ or } R_7(O_2CHY)_r$$

where R_2 is a radical molecular weight less than about 10000 obtained by removal of active hydrogen from an active hydrogen compound selected from the group consisting of water, alcohols, thiols, carboxylic acids, carboxylic amides and amines, where the functionality of R_2 is n and is in the range of 1 to 10, where E is a divalent radical selected from the group represented by the formulae



where X is selected from the group consisting of H, CH_3,C_2H_5 and CH_2OCH_2Y,Y being selected from the group consisting of



where a is 0 or 1, where R_3 is hydrogen or an unsubstituted or substituted C_1 to C_{10} hydrocarbyl radical, where R_4 is a divalent unsubstituted or substituted C_2 to C_{10} hydrocarbyl radical and where the product of m and n is at least 4 and not more than about 60; where R_5 is a C_2 to C_{12} aliphatic hydrocarbyl or oxahydrocarbyl radical of equivalence p in the range of 4 to 12; where R_6 is absent or is a C_1 to C_{20} unsubstituted or substituted hydrocarbyl group and q is in the range of 2 to about 30; R_7 is a radical of molecular weight less than about 10,000 obtained by removal of at least two active hydrogens from a polyol and r is in the range of about 1 to about 170; and wherein the weight ratio of α,β-ethylenically unsaturated compound to allyloxy compound is in the range of about 30:70 to about 99:1; and wherein the allyloxy compound contains from 4 to 60 allyloxy groups per molecule.

4,945,144

RING OPENING METHATHESIS POLYMERIZATION OF STRAINED CYCLIC ETHERS

Robert H. Grubbs, South Pasadena, and Bruce M. Novak, El Sobrante, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 371,982, Jun. 22, 1989, Pat. No. 4,883,851, and a continuation-in-part of Ser. No. 223,406, Jul. 25, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,881
Int. Cl.[5] C08F 24/00
U.S. Cl. 526—268 3 Claims

1. A process of initiating polymerization of a strained cyclic olefin comprising contacting said olefin with a dilute aqueous solution of a derivative of 7-oxanorbornene.

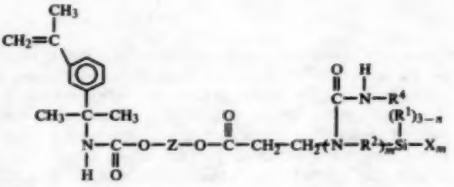
4,945,145

SILANE COATING COMPOSITION FOR AMBIENT CURE

Paul P. Bruylants, Sicklerville; Patrick H. Corcoran, Cherry Hill, both of N.J., and John A. Simms, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 6, 1989, Ser. No. 334,514
Int. Cl.[5] C08F 30/08
U.S. Cl. 526—279 5 Claims

1. A curable resin having a number average molecular weight of 1,000 to 100,000 of a copolymer of a prepolymer (F) having a number average molecular weight of 550 to 1770 with a vinyl monomer (D), said prepolymer (F) having the formula (III):



where R^4 is an alkyl, cycloalkyl, aryl or aralkyl group having 1 to 30 carbon atoms or a group having the formula $(C_2H_5O)_3$—Si—$(CH_2)_3$—; R^1 is an alkyl, aryl or aralkyl group having 1 to 10 carbon atoms; R^2 is a bivalent group having 1 to 10 carbon atom selected from the group consisting of alkylene, arylene and aralkylene groups; X is a hydrolyzable group selected from the group consisting of a halogen atom, an alkoxyl group, an acyloxyl group, a ketoxymate group, mercapto group and an alkenyloxy group;
Z is a residue of an oligomer (A) having a number average molecular weight of 28 to 900 and having one group consisting of acryloyl group and one group consisting of a hydroxy group, n is an integer of 1 to 3, and m is an integer of 1 to 10.

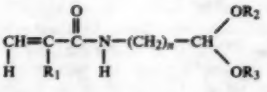
4,945,146

DISPERSION POLYMERS PROCESSES FOR THEIR PREPARATION AND THEIR USE

Wolfgang Kapmeyer, Marburg, and Helmut Rinno, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 943,802, Dec. 29, 1986, abandoned. This application Nov. 18, 1987, Ser. No. 124,338
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545595
Int. Cl.[5] C08F 265/10
U.S. Cl. 526—304 13 Claims

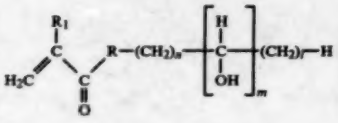
1. A process for preparing a dispersion polymer comprising the steps of:
(a) adding an emulsifier and a free-radical initiator to an aqueous seed dispersion of latex having a particle diameter of 0.02 μm to 2 μm; and
(b) adding dropwise with stirring at a temperature in the range of 10° C. to 120° C. to the seed dispersion containing the emulsifier and the initiator a monomer of Formula I



in which
n denotes 1–6;
R_1 denotes H or CH_3;

R_2 and R_3 are identical or different and denote $-(CH_2)_m-CH_3$, and
m denotes 0–7, or

in which
X, Y and Z denote $(CH_2)_p-CH_3$ and
p denotes 1–3, where
X, Y and Z are identical or different, and a monomer of Formula II



in which
R denotes O or NH;
n denotes 1–3;
m denotes 1–4;
l denotes 0–4; and
R_1 denotes H or CH_3
to form a dispersion polymer comprising latex particles and a copolymer of Formula I and II formed on the surface of the particle.

11. A biologically active dispersion polymer, comprising a dispersion polymer obtained by the process of claim 1 and an antibody, an antigen or a hapten bonded thereon.

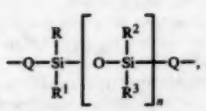
4,945,147

AROMATIC POLYESTER-SILOXANE BLOCK COPOLYMERS AND METHOD FOR MAKING

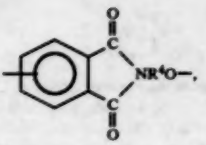
Peter P. Policastro, Niskayuna, N.Y.; Pamela K. Hernandez, North Olmsted, Ohio; Sandra A. Swint, Schenectady, N.Y.; Gary C. Davis, Albany, N.Y.; Jonathan D. Rich, Rexford, N.Y.; Philip J. McDermott, Clifton Park, N.Y., and Thomas L. Guggenheim, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

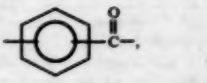
Filed Mar. 6, 1989, Ser. No. 319,027
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—26 **10 Claims**

1. An aromatic polyester-siloxane block copolymer comprising chemically combined aromatic polyester units selected from the class consisting of dihydric phenol units, aromatic diacid units and condensed mixtures thereof, and 0.1 to 100 mole percent of condensed siloxane units based on the total moles of condensed polyester units and siloxane condensed units in the aromatic polyester-siloxane block copolymer, where the condensed siloxane units have the formula,



Q is a member selected from the class consisting of





and mixtures thereof, R–R^3 are selected from $C_{(1-13)}$ monovalent hydrocarbon radicals and $C_{(1-13)}$ monovalent hydrocarbon radicals substituted with radicals inert during condensation reaction, R^4 is a $C_{(6-13)}$ divalent aromatic organic radical and n is an integer having a value of from 1 to 200 inclusive.

4,945,148

SILICON-POLYCARBONATE BLOCK COPOLYMERS

Jonathan D. Rich, Rexford; Philip J. McDermott, Clifton Park; Gary C. Davis, Albany; Peter P. Policastro, Niskayuna; Karen A. Regh, Clifton Park, all of N.Y.; Pamela K. Hernandez, North Olmsted, Ohio, and Thomas L. Guggenheim, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,025
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—26 **5 Claims**

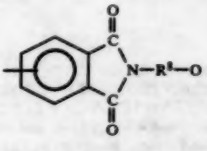
1. A silicone-polycarbonate block copolymer having 0.5 to 90% by weight of silicone blocks and comprising recurring chemically combined groups having the formula

—YD—,

where
Y is a divalent organosilicon siloxane group having the formula

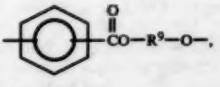
(4)

Q is a member selected from the class consisting of



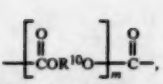
(5)

and



(6)

and mixtures thereof,
D is a divalent polycarbonate block having the formula



where R—R[3] are selected from the same or different $C_{(1-14)}$ hydrocarbon radicals or $C_{(1-14)}$ hydrocarbon radicals substituted with radicals inert during equilibration or condensation, R^8 is selected from divalent $C_{(6-13)}$ divalent arylene radicals $OCC_{(6-13)}$ *divalent arylene radicals substituted with radicals inert during equilibration or condensation*, R^9 and R^{10} are selected from $C_{(6-20)}$ divalent aromatic hydrocarbon radicals, or $C_{(6-20)}$ divalent aromatic hydrocarbon radicals substituted with radicals inert during equilibration and condensation, n is an integer equal to from 1 to 200 inclusive and m is an integer equal to from 1 to 50 inclusive.

4,945,149

COATING COMPOSITION A NON-POROUS MOISTURE-PERMEABLE COATING LAYER OR FILM OF A HYDROPHILIC POLYURETHANE RESIN

Yukio Matsumoto, and Nobuaki Kunii, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 903,964, Sep. 5, 1986, abandoned. This application Aug. 2, 1988, Ser. No. 229,727

Claims priority, application Japan, Sep. 6, 1985, 60-196085

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—61 **7 Claims**

1. A coating composition for forming a substantially non-porous moisture-permeable coating layer or film of a hydrophilic polyurethane resin, which comprises (i) a prepolymer of a polyol combination and a polyisocyanate compound, said prepolymer having a viscosity of a most 10,000 cp at 25° C. and (ii) a curing agent for said prepolymer selected from the group consisting of a diol and a diamine having a molecular weight of 200 or less, said polyol combination comprising:

(a) from about 50 to about 98% by weight of polyoxyethylene polyol having an oxyethylene group content of from about 50 to about 90% by weight, at least 5% by weight of C_3–C_4 alkylene oxide residues, a hydroxyl value of from about 15 to about 60 and at least 3 hydroxyl groups; and

(b) from about 2 to about 50% by weight of a diol having a molecular weight of from about 62 to about 2,000 which may contain oxyethylene groups;

provided that the molar equivalent ratio of the component (b) to the component (a) is from about 0.3 to about 3, and the total oxyethylene group content in the components (a) and (b) is from about 75% to about 95% by weight.

4,945,150

MELT PROCESSABLE THERMOTROPIC AROMATIC COPOLYESTER DERIVED FROM HYDROXY PHENOXY BENZOIC ACIDS AND HYDROXY BENZOIC ACID

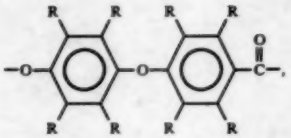
William B. Marshall; James R. Pribish, and James L. Brewbaker, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 4, 1989, Ser. No. 348,317

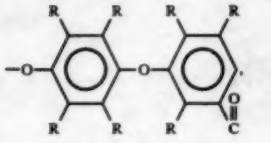
Int. Cl.[5] C08G *63/02, 63/00*

U.S. Cl. 528—193 **13 Claims**

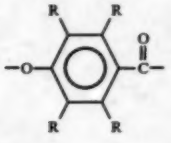
1. A copolymer capable of forming an optionally anisotropic melt comprising recurring structural units (a) independently selected from the group consisting of Formulas I, II, and mixtures thereof; and recurring structural units (b) independently selected from the group consisting of Formula III:



I



II



III

wherein each R is a chemically inert substituent.

4,945,151

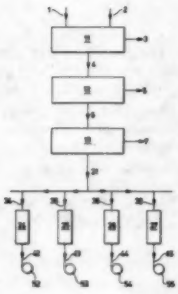
CONTINUOUS PRODUCTION OF POLYESTER FILAMENTS

George R. Goodley, Kinston, and Harold J. Taylor, Emerald Isle, both of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 8, 1989, Ser. No. 320,551

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—272 **6 Claims**



1. An improvement in a continuous process for producing spin-oriented polyester filaments from ethylene glycol and dimethyl terephthalate or terephthalic acid, in which polyester polymer is prepared and melt-spun from a plurality of spinning machines, and whereby said improvement provides a capability to spin a plurality of mergible products, wherein said improvement is characterized by incorporating into the polymer a chain-branching agent in controlled amounts which may vary within the range of about 0.2 to about 0.6 MEQ and wherein dyeability of products prepared from the filaments is determined periodically and the amounts of chain-branching agent added are varied and adjusted to maintain a substantially uniform dyeability in said mergible products.

4,945,152

MOLDED NYLON 4.6 ARTICLE HAVING FIRST AND SECOND ENTHALPY

Erik R. Peerlkamp, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 111,062, Oct. 22, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,711

Claims priority, application Netherlands, Nov. 20, 1986, 8602947; European Pat. Off., Mar. 28, 1988, 88200584.6

Int. Cl.[5] C08G 69/46

U.S. Cl. 528—335 7 Claims

1. A molded polyamide article consisting substantially of tetramethylene adipamide units, having a first melting enthalpy which is at least 30 Joules per gram higher than a second melting enthalpy determined after melting and subsequent solidification of the polyamide, the first melting enthalpy being determined on a sample of the molded article by differential scanning calorimetry (DSC), with a heating rate of 5° C. per minute, and the second melting enthalpy being determined after the molten polyamide has cooled at a rate of 5° C. per minute to below its crystallization temperature and after complete solidification is reheated at a heating rate of 5° C. per minute.

4,945,153

METHOD OF PRODUCING PREPOLYMER OF AROMATIC POLYTHIAZOLE IN THE PRESENCE OF A PHOSPHORIC ACID COMPOUND

Hideo Nishino, Miyoshi; Tatsuya Hattori, Wako; Tsuneharu Kushida, and Masataka Kumata, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1989, Ser. No. 362,513

Claims priority, application Japan, Jun. 8, 1988, 63-140807

Int. Cl.[5] C08G 75/32

U.S. Cl. 528—337 4 Claims

1. A method of producing a prepolymer of aromatic polythiazole from an aromatic diaminodithiol compound salt and a dicarboxylic acid derivative, comprising the step of polymerizing said aromatic diaminodithiol compound salt and said dicarboxylic acid derivative in the presence of a phosphoric acid compound at a temperature of 70°–140° C.

4,945,154

DENSIFIED POLYETHERSULFONE

Mounir M. Ghali, Dublin, and Winston L. Hedges, Livermore, both of Calif., assignors to Hexcel Corporation, Dublin, Calif.

Filed Jul. 7, 1989, Ser. No. 377,116

Int. Cl.[5] C08F 6/14

U.S. Cl. 528—480 12 Claims

1. Densified polyethersulfone (PES) in the form of particles about 1–100 microns in diameter of reduced surface area as compared with undensified polyether sulfone prepared by solution polymerization followed by precipitation, such that up to 40% by weight of said densified polyethersulfone may be added to a thermosetting resin, with retention of sufficient tack and flow for processability.

4,945,155

PREPARATION OF LOW COLOR COPOLY(ARYLENE SULFIDE) BY HEATING COPOLY(ARYLENE SULFIDE)

David R. Fagerburg; Mark Rule; Joseph J. Watkins, and Paul B. Lawrence, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 11, 1989, Ser. No. 350,668

Int. Cl.[5] C08G 75/16

U.S. Cl. 528—480 12 Claims

1. A process comprising heating for a minimum of 5 minutes and at a temperature in the range of the glass transition temperature of the polymer to 5 degrees C. below the melting point of the polymer, a solid, comminuted, copoly(arylene sulfide) prepared by reacting at a polymer producing temperature a mixture of a diiodoaromatic compound and elemental sulfur which contains less than 0.05 weight percent sulfur which contains less than 0.05 weight percent carbon, the copoly(arylene sulfide) corresponding to the structure

$$[(-A-S-)_{1-x}(-A-S-S-)_x]_n$$

wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.2 to 0.005 and n is at least 100.

4,945,156

SOLUTION PROCESSING OF RIGID CHAIN AND LADDER POLYMERS

Samson A. Jenekhe, Rochester, N.Y., and James R. Peterson, St. Paul, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 29, 1988, Ser. No. 291,792

Int. Cl.[5] C08J 3/02; C08G 73/18, 73/22

U.S. Cl. 528—485 26 Claims

1. A method of regenerating pristine macromolecular polymer compounds, of a class normally insoluble in aprotic organic solvents from solubilized electron acceptor mediating agent complexes thereof in an aprotic organic solvent system comprising the step of decomplexation of the mediating agent with respect to the macromolecular polymer.

4,945,157

NOVEL EXTRACTION PROCEDURE FOR PROTEIN G

Michael D. P. Boyle, and Ervin Faulmann, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 27, 1988, Ser. No. 199,548

Int. Cl.[5] C07K 3/28, 15/04

U.S. Cl. 530—409 9 Claims

1. A process for recovering protein G from wild-type group G or group C streptococci which comprises

(a) extracting protein G with cyanogen bromide from group G or group C streptococcus bacteria to obtain a soluble phase containing protein G;

(b) concentrating and dialyzing said soluble phase containing protein G to obtain a concentrate; and

(c) treating said concentrate with a source of primary amine at a pH of about 8 to about 10 to obtain a concentrated preparation of protein G wherein the chemically reactive homoserine carboxy terminal residue has been blocked.

4,945,158

ANTIDIABETIC PHOSPHONATES

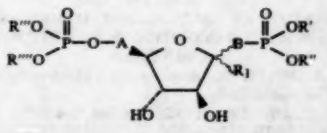
Vern G. DeVries, Ridgewood; Thomas H. Claus, Montvale, both of N.J.; Middleton B. Floyd, Jr., Suffern, and Semiramis Ayral-Kaloustian, Tarrytown, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 12, 1988, Ser. No. 232,333

Int. Cl.[5] C07H 11/04

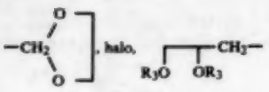
U.S. Cl. 536—117 17 Claims

1. A compound selected from those of the formula:



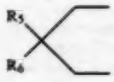
wherein A and B are selected independently of each other from the group consisting of C_1 to C_4 alkylene and C_2 to C_4 hydroxyalkylene R_1 is selected from the group consisting of hydrogen, hydroxy, C_1 to C_4 alkyl, C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl, C_3 or C_4 trihydroxyalkyl and C_4 tetrahydroxyalkyl; R′, R″, R‴ and R⁗ are selected independently from the group consisting of hydrogen, C_1 to C_{18} alkyl, C_3 to C_6 cycloalkyl, phenyl, mono- and disubstituted phenyl

(wherein the substituents are selected from alkyl C_1 to C_6, alkoxy C_1–C_6, NO_2 or halo), C_3 to C_8 isoalkyl, Cl_3CCH_2—, CH_2=$CHCH_2$—, ZCH_2CH_2— (where Z is SO_2R_2, SR_2, OR_2 or $Si(R_2)_3$ and R_2 is C_1 to C_3 alkyl),

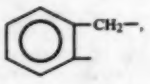


where R_3 is C_1 to C_3 alkyl and R_3–R_3 is alkylene or acetal),

where R_4 is hydrogen or methyl),



(where R_8 is hydrogen or C_1 to C_{18} alkyl,



phenylmethyl, substituted phenylmethyl wherein the substituents are selected from C_1 to C_{18} alkyl, C_1 to C_6 alkoxy, nitro and halogen; and with the provisos that (a) when A and B are both —CH_2— and R′, R″, R‴ and R⁗ are the same and are phenyl or ethyl, then R_1 may not be hydrogen, and (b) when A and B are both —CH_2— and R′, R″, R‴ and R⁗ are hydrogen, then R_1 may not be hydrogen or —CH_2OH; and, when any one or more of R′, R″, R‴, or R⁗ are hydrogen, the pharmaceutically acceptable salts thereof.

4,945,159

FORMATION OF LACTAMS AND OTHER AMIDES UNDER MILD CONDITIONS BY ACTION OF CYANOGEN

Richard A. Day, Cleves, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Filed Dec. 2, 1986, Ser. No. 936,891

Int. Cl.[5] C07D *501/06, 499/10, 213/127;* **C07C** *102/04*

U.S. Cl. 540—215 **10 Claims**

10. A method of preparing a cyclic amide comprising recting (1) a compound selected from the group consisting of lactam-requiring precursors of penicillins, cephalosporins and other beta-lactams containing at least one carboxylic acid group and at least one group selected from the group consisting of primary and secondary amino groups with (2) cyanogen for sufficient time and at sufficient temperature and pressure to form at least one intramolecular amide bond within said organic compound.

4,945,160

PREPARATION OF CERTAIN 7-SUBSTITUTED QUINOLONES

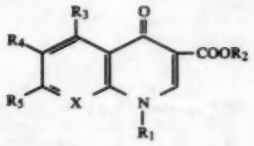
John S. Kiely, Ann Arbor, Mich.; Lawrence E. Lesheski, Dublin, Ohio, and Mel C. Schroeder, Dexter, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 22, 1988, Ser. No. 275,149

Int. Cl.[5] C07D *215/56*

U.S. Cl. 540—481 **10 Claims**

1. A process for the preparation of a compound of formula



I

or a pharmaceutically acceptable salt thereof wherein:

R_1 is lower alkyl,

aryl,

alkenyl,

cycloalkyl of from three to six carbon atoms,

R_2 is hydrogen, alkyl, or metal salts;

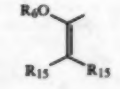
R_3 is hydrogen, halogen, OR_8, alkyl, $N(R_9)_2$

wherein R_8 is hydrogen, lower alkyl, lower acyl, trialkylsilyl and R_9 is hydrogen, lower alkyl, lower acyl maleimido, phthalimido, succinimido;

R_4 is hydrogen, halogen or lower alkyl;

X is [N or] CR_{10} wherein R_{10} is hydrogen, halogen, CN, CF_3, OR_8, alkyl, $N(R_9)_2$ wherein R_8 and R_9 are as above; [X and R_1 may be joined by C—Y—$CH_2CH(CH_3)$ where Y is O, S or N-alkyl to form a ring;]

R_5 is [aryl,] [cycloalkyl,] [cycloalkenyl,]

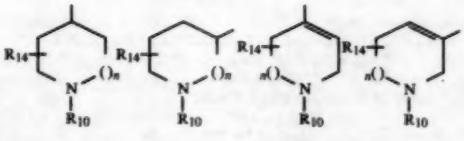


wherein R_6 is lower alkyl or R_7Si

wherein R_7 is lower alkyl or phenyl

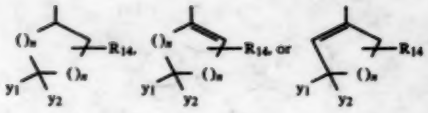
and R_{15} is hydrogen, alkyl, alkenyl, aryl, or halogen; or

or R_5 may be a saturated or partially unsaturated heterocyclic ring



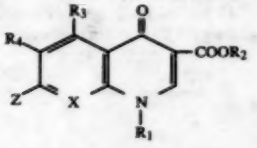
wherein n is an integer of from 0 to 4 and R_{10} is hydrogen, lower alkyl, or lower acyl and R_{14} is one or more substituents selected from H, alkyl, aryl, or halogen provided the ring is attached through a carbon atom of the heterocyclic ring,

or R_5 is



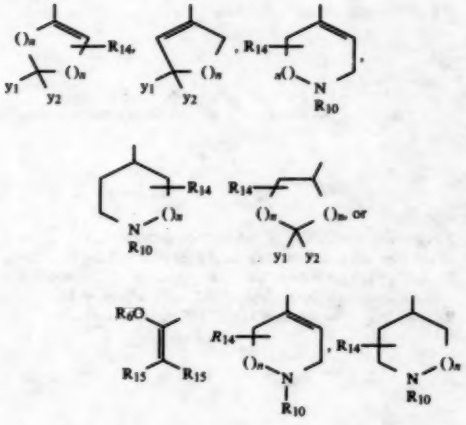
wherein Y_1 and Y_2 are each independently hydrogen, alkyl, OR_8, or $N(R_9)_2$ or taken together are $=O$ or $=NOR_8$ wherein R_8 and R_9 are as above, and $\eta=0$-4 and R_{14} is as above;

which comprises reacting a compound of formula



II

or a pharmaceutically acceptable salt thereof wherein R_1, R_2, R_3, R_4, and X are as described above and [Z is halogen when the compound is a naphthyridine and] Z is (halogen)$_3CSO_3$-with a tetraorganostannane of the formula III $(R_{12})_3SnR_{13}$ wherein R_{12} is alkyl, [alkenyl, alkynyl, cycloalkyl, cycloalkenyl, or aryl] and R_{13} is



wherein n, R_{14}, R_{10}, R_6, R_{15}, Y_2 and Y_2 are as described previously in the claim to produce the desired compound of formula I.

4,945,161

PROCESS FOR THE PREPARATION OF N,N'-BIS-(2-HYDROXY-ETHYL) PIPERAZINE

Giuseppe Messina, Alghero; Paolo Calaresu, Sassari, and Loreno Lorenzoni, Porto Torres, all of Italy, assignors to Enichem Anic S.p.A., Palermo, Italy

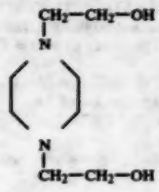
Filed Apr. 21, 1989, Ser. No. 345,361

Claims priority, application Italy, Apr. 21, 1988, 20273 A/88

Int. Cl.[5] C07D *295/08*

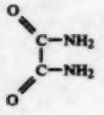
U.S. Cl. 544—401 **10 Claims**

1. A process for preparing N,N'-bis-(2-hydroxyethyl)-piperazine (I)



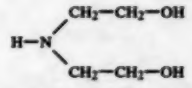
(I)

which comprises heating to a temperature of from 50° to 268° C. oxamide (II)



(II)

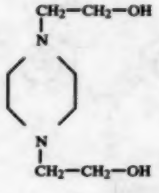
with diethanolamine (III)



(III)

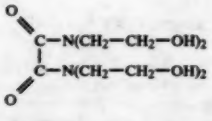
wherein the molar ratio diethanolamine/oxamide is >2, the reaction being carried out under conditions wherein the molar ratio of diethanolamine (III) to oxamide (II) is initially at least 2, and the total amount of diethanolamine (III) employed during the course of the reaction is such that the ratio of the total amount of diethanolamine (III) employed to oxamide (II) during the course of the reaction is greater than 2, any unreacted diethanolamine (III) serving as a reaction solvent.

9. A process for preparing N,N'-bis-(2-hydroxyethyl)-piperazine (I)



(I)

which comprises heating to a temperature of from 160° to 268° C. N,N'-tetra-(2-hydroxyethyl)oxamide (IV)



(IV)

in the presence of diethanolamine.

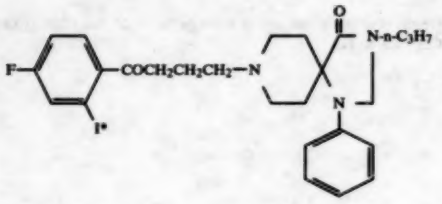
4,945,162

NOVEL RADIOACTIVE PROPYL 2-IODOSPIROPERIDOL AND PROCESSES FOR THE PREPARATION THEREOF

Iwao Nakatsuka, Kobe, and Masami Okuno, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 4, 1987, Ser. No. 128,821
Claims priority, application Japan, Dec. 26, 1986, 61-314256
Int. Cl.[5] C07D 471/10
U.S. Cl. 546—20 2 Claims

1. A radioactive propyl 2-iodospiroperidol of the formula:



wherein I* is radioactive iodine atom.

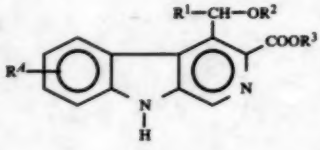
4,945,163

PROCESS FOR THE PREPARATION OF 4-ALKOXYALKYL β-CARBOLINES

Andreas Huth; Dieter Rahtz; Ralph Rohde; Ralph Schmiechen, and Dieter Seidelmann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,086
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1987, 3729370
Int. Cl.[5] C07D 471/14; A61K 31/435
U.S. Cl. 546—85 19 Claims

1. A process for the preparation of a 4-alkoxyalkyl β-carboline of Formula I



wherein

R^1 is hydrogen or methyl;

R^2 is a saturated or unsaturated, straight-chain or branched, aliphatic hydrocarbon residue containing 1–6 carbon atoms or a cycloalkyl or cycloalkylalkyl group containing 3–7 carbon atoms which can contain 1–3 substituents, said substituents being halogens or C_{1-2}-alkoxy groups;

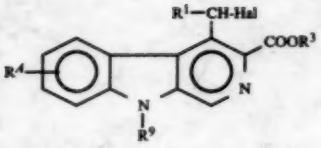
R^3 is C_{1-4}-alkyl;

R^4 is hydrogen, halogen, $COOR^4$ or OR^5;

R^4 is C_{1-4}-alkyl;

R^5 is hydrogen, C_{1-4}-alkyl, C_{5-7}-cycloalkyl, unsubstituted phenyl, or a substituted phenyl group containing 1–3 substituents selected from the group comprising chlorine, bromine, iodine, fluorine, C_{1-4}-alkyl and C_{1-4}-alkoxy;

comprising reacting a compound of general Formula II



wherein

R^1, R^3, R^4, R^5 and R^4 have the meanings given above,

Hal is halogen, and

R^9 is an acyl, arylsulfonyl, or silyl group, in the presence of $AgBF_4$ with an alcohol of the formula

R^2OH wherein R^2 has the meanings indicated above, and optionally splitting off the blocking group.

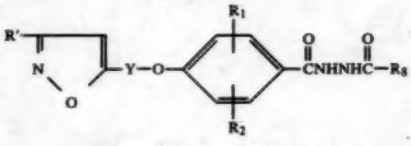
4,945,164

1,3,4-OXADIAZOLYL-PHENOXYALKYLISOXAZOLES AND THEIR USE AS ANTIVIRAL AGENTS AND INTERMEDIATES THEREOF

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 18, 1989, Ser. No. 396,419
Int. Cl.[5] C07D 261/10
U.S. Cl. 548—247 3 Claims

1. A compound of the formula



wherein:

Y is an alkylene bridge of 3–9 carbon atoms;

R' is lower-alkyl or hydroxy-lower-alkyl of 1–5 carbon atoms;

R_1 and R_2 are hydrogen, halogen, lower-alkyl, lower-alkoxy, nitro, lower-alkylcarbonyl or trifluoromethyl; and

R_8 is hydrogen or lower-alkyl of 1–5 carbon atoms.

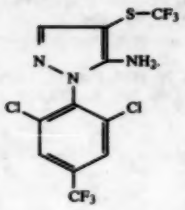
4,945,165

PEST-COMBATING AGENTS BASED ON PYRAZOLE DERIVATIVES

Uta Jensen-Korte, Dusseldorf; Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Heinz-Jürgen Wroblowsky, Langenfeld; Benedikt Becker, Mettmann; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath-Steinenbruck; Wilhelm Stendel, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 201,649, Jun. 2, 1988, abandoned, which is a continuation of Ser. No. 858,475, Apr. 30, 1986, Pat. No. 4,804,675. This application Jul. 21, 1989, Ser. No. 384,188
Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3717843; Jan. 30, 1986, 3602728
Int. Cl.[5] C07D 231/44
U.S. Cl. 548—362 3 Claims

1. A 5-aminopyrazole having the formula



4,945,166

PREPARATION OF N-HYDROXYPYRAZOLES

Ulf Baus, Dossenheim; Wolfgang Reuther, Heidelberg, and Rolf Fikentscher, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

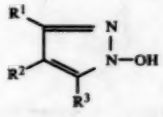
Filed Jun. 16, 1989, Ser. No. 367,053

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820738

Int. Cl.[5] C07D 231/12, 231/54, 231/56

U.S. Cl. 548—369 8 Claims

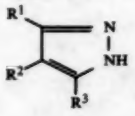
1. A process for the preparation of an N-hydroxypyrazole of the formula I



(I)

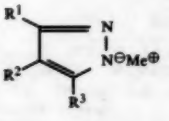
where R^1, R^2 and R^3 may be identical or different and are each hydrogen, alkyl, halogen or aryl, or R^1 and R^2 or R^2 and R^3 together with the carbon atoms carrying these radicals form an aromatic or nonaromatic ring of 5 or 6 carbon atoms, wherein

(A) a pyrazole of the formula II



(II)

where R^1, R^2 and R^3 have the meanings stated for formula I, is converted in a conventional manner with an alkali metal hydroxide, alkali metal hydride or alkali metal carbonate into one of its metal salts of the formula III



(III)

where R^1, R^2 and R^3 have the meanings stated for formula I and Me^{61} is a cation of an alkali metal, and

(B) the resulting metal salt of the formula III is reacted with a diacyl peroxide.

4,945,167

PREPARATION OF N-HYDROXYPYRAZOLES

Ulf Baus, Dossenheim; Wolfgang Reuther, and Erwin Hahn, both of Heidelberg, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

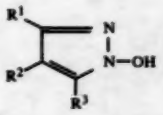
Filed Jun. 16, 1989, Ser. No. 367,047

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820739

Int. Cl.[5] C07D 231/12

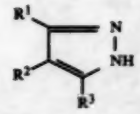
U.S. Cl. 548—375 12 Claims

1. A process for the preparation of a N-hydroxypyrazole of the formula I



(I)

where R^1, R^2 and R^3 may be identical or different and are each hydrogen or halogen, wherein a pyrazole of the formula II



(II)

where R^1, R^2 and R^3 have the meanings stated for formula I, is reacted with an aliphatic or aromatic peroxocarboxylic acid in such a way that the reaction temperature is from −5° C. to 60° C.

4,945,168

METHOD OF PREPARING ARYL-(1-PHTHALIMIDO)-ALKYL KETONES

Franz Effenberger, Stuttgart, and Dieter Steegmüller, Magstadt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

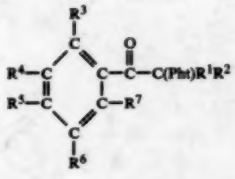
Filed Aug. 22, 1988, Ser. No. 234,635

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727898

Int. Cl.[5] C07D 405/06, 209/48

U.S. Cl. 548—454 3 Claims

1. A method of preparing aryl-(1-phthalimido)-alkyl ketones of the general formula



in which

R^1 signifies hydrogen or a straight-chain or branched (C_1–C_4)-alkyl group,

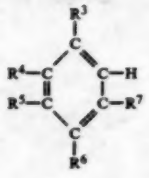
R^2 signifies hydrogen, a straight-chain or branched (C_1–C_8)-alkyl group, a benzyl group, a 4-(C_1–C_4)-alkoxy benzyl group, a 4-benzyloxybenzyl group, a 3,4-di-(C_1–C_4)-alkoxy-benzyl group, a 1,3-benzodioxol-5-yl-methyl group, an N-formyl-indole-3-yl-methyl group, an N-(C_2–C_3)-acylindole-3-yl-methyl group, a 5-(C_1–C_4)-alkoxy-N-(C_2–C_3)-acyl-indole-3-yl-methyl group, a 5-(C_1–C_4)-alkoxy-N-formyl-indole-3-yl-methyl group or a (C_1–C_4)-alkyl group substituted by a (C_1–C_6)-alkoxy group, a benzyloxy group, a

phenyloxy group, a phthalimido group, a (C_1–C_4)-alkoxycarbonyl group or a benzyloxy carbonyl group,

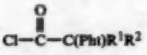
R^3, R^4, R^5, R^6 and R^7 signify, independently of each other, hydrogen, a straight-chain or branched (C_1–C_4)-alkyl group, a (C_1–C_6)-alkoxy group, a benzyloxy group or a phenyloxy group and

Pht signifies a phthalimido group,

which comprises reacting an aromatic compound of the general formula



in which R^3, R^4, R^5, R^6 and R^7 each have one of the meanings already given is reacted in an inert solvent in the presence of iron-(III)-chloride with an N-phthaloyl-2-amino carboxylic acid chloride of the general formula



(III)

in which R^1, R^2 and Pht have the meanings already given wherein the iron-(III)-chloride is added in an amount between 0.5 and 50 mole percent in relation to the amount of N-phthaloyl-2-amino carboxylic acid chloride added.

4,945,169

BIS-MALEIMIDE COMPOUNDS CONTAINING SULFONATE LINKAGES

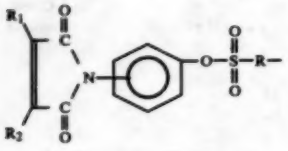
Bojayan Durairaj, Pittsburgh, Pa., assignor to Indspec Chemical Corporation, Pittsburgh, Pa.

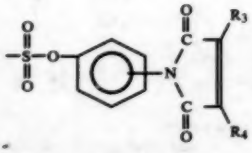
Filed Jul. 6, 1988, Ser. No. 215,555

Int. Cl.[5] C07D *403/10, 403/12*

U.S. Cl. 548—521 **8 Claims**

1. Bis-maleimides containing sulfonate linkages of the formula:





wherein R is a divalent radical selected from the group consisting of meta phenylene, para phenylene, naphthalene and radicals of the formula A—A and A—Z—A wherein A is selected from the group consisting of meta phenylene, para phenylene and naphthalene and Z is selected from the group consisting of meta phenylene, para phenylene, naphthalene oxygen, —CH=CH— and —C≡C—and R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, an alkyl group having from 1 to about 4 carbon atoms and a halogen.

4,945,170

METHOD FOR MAKING POLYIMIDES AND PRODUCTS PRODUCED THEREBY

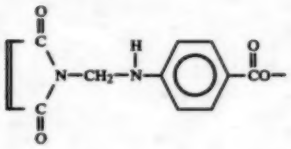
Dalip K. Kohli, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

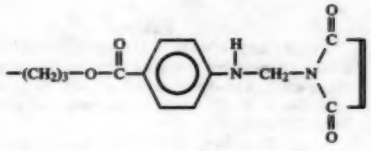
Division of Ser. No. 695,991, Jan. 29, 1985, Pat. No. 4,608,431. This application May 30, 1986, Ser. No. 868,489

Int. Cl.[5] C07D *207/404*

U.S. Cl. 548—522 **1 Claim**

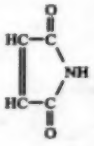
1. A method for the preparation of a bismaleimide of the formula:





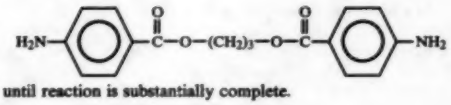
which comprises heating a mixture comprising

(i) maleimide, a compound of the formula



(ii) from about 0.5 to about 2 moles per mole of (i) of formaldehyde; and

(iii) from about 0.5 to 2 moles per mole of (i) of an arylene diamine of the formula



until reaction is substantially complete.

4,945,171

XANTHENE DYES HAVING A FUSED (C) BENZO RING

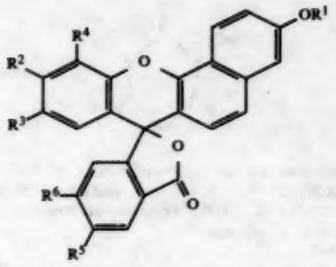
Richard P. Haugland, Junction City, and James Whitaker, Eugene, both of Oreg., assignors to Molecular Probes, Inc., Eugene, Oreg.

Filed Aug. 10, 1987, Ser. No. 83,459

Int. Cl.[5] C07D *311/78*

U.S. Cl. 549—224 **25 Claims**

1. A compound of the formula:



wherein:

R^1 is hydrogen, acetyl or methyl,

R^2 is hydroxyl, acetoxyl, dimethylamino, diethylamino, ethylamino or methoxyl

R^3 is hydrogen, hydroxyl, halo, methyl or carboxyethyl

R^4 is hydrogen,

R^5 is hydrogen, carboxyl or acetoxymethoxycarbonyl, and

R^6 is hydrogen, carboxyl or acetoxymethoxycarbonyl.

4,945,172

PREPARATION OF N-FORMYL-L-ASPARTIC ANHYDRIDE

John B. Hill, Woodstock; Hugh L. Dryden, Jr., Deerfield, and Robert Erickson, Des Plaines, all of Ill., assignors to The Nutra Sweet Company, Deerfield, Ill.

Continuation of Ser. No. 156,268, Feb. 12, 1988, abandoned. This application Nov. 28, 1989, Ser. No. 442,040

Int. Cl.[5] C07D 307/22

U.S. Cl. 549—253 **14 Claims**

1. A method which comprises:

(a) reacting L-aspartic acid with formic acid in the presence of an effective amount of acetic anhydride under conditions sufficient to form N-formyl-L-aspartic anhydride; and thereafter

(b) adding to (a) above an effective amount of a C_3–C_6 secondary alcohol to consume excess formic acid wherein the resulting N-formyl-L-aspartic anhydride reaction mixture is suitable for further reactions without modification.

4,945,173

PROCESS FOR THE PRODUCTION OF GAMMA-BUTYROLACTONE

Michael A. Wood, Middlesbrough, England, assignor to Davy McKee (London) Limited, London, England

Filed Jul. 22, 1988, Ser. No. 223,079

Claims priority, application United Kingdom, Jul. 29, 1987, 8717992

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] C07D 307/33

U.S. Cl. 549—295 **16 Claims**

1. A process for the production of substantially pure gamma-butyrolactone from a feed mixture containing a major amount of gamma-butyrolactone and a minor molar amount of diethyl succinate which comprises:

(a) providing a fractionation zone;

(b) providing a stream comprising diethyl ethoxysuccinate;

(c) supplying the feed mixture to the fractionation zone;

(d) supplying the stream of step (b) to the fractionation zone;

(e) fractionally distilling the feed mixture in the fractionation zone in the presence of diethyl ethoxysuccinate of the stream of the step (b); and

(f) recovering from the fractionation zone;

(A) an overhead vaporous product comprising gamma-butyrolactone which is substantially free from diethyl succinate; and

(B) a liquid bottom product comprising diethyl ethoxysuccinate and diethyl succinate in admixture one with another.

4,945,174

PALLADIUM-BASED COMPLEXES

Marc Huser, and John Osborn, both of Strasbourg, France, assignors to Rhone Poulenc Chimie, Courbevoie, France

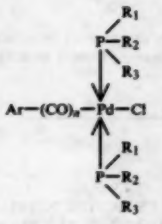
Filed Jul. 20, 1989, Ser. No. 383,077

Claims priority, application France, Jul. 20, 1988, 88 09789

Int. Cl.[5] C07F 15/00

U.S. Cl. 556—16 **15 Claims**

1. A complex of the formula (I)



(I)

in which

Ar is a substituted or an unsubstituted mono- or polycyclic or heterocyclic aromatic radical

each of R_1, R_2, and R_3 is identical or different and is selected from cyclohexyl, benzyl and isopropyl radicals, with the proviso that one of R_1, R_2, or R_3 can be a phenyl group when the other two are a cyclohexyl group, and

n is an integer equal to 0 or 1.

4,945,175

DEHYDROCYCLODIMERIZATION PROCESS START-UP PROCEDURE

Simon H. Hobbs, Chicago, and Christopher D. Gosling, Roselle, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed May 26, 1989, Ser. No. 357,221

Int. Cl.[5] C07C 2/02, 2/00

U.S. Cl. 585—417 **14 Claims**

1. A process for the dehydrocyclodimerization of C_2–C_5 hydrocarbons in the presence of a catalyst comprising a phosphorous containing alumina, a gallium component, and a crystalline aluminosilicate zeolite having a silica to alumina molar ratio of at least 12 characterized in that the start-up of the process comprises:

(a) contacting the catalyst with a dry start-up gas comprising 50 mole percent or less hydrogen;

(b) heating the catalyst in the presence of the dry start-up gas to a temperature at which the dehydrocyclodimerization reaction will occur;

(c) passing the C_2–C_5 hydrocarbons across the heated catalyst and thereby producing a dehydrocyclodimerization reaction product including hydrogen; and

(d) displacing the non-hydrogen dry start-up gas from the process with the gaseous product of the dehydrocyclodimerization reaction including hydrogen.

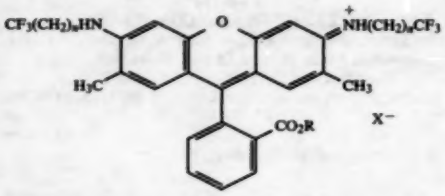
4,945,176

NOVEL FLUORINATED LASER DYES

Peter R. Hammond, Livermore, Calif., and James F. Feeman, Wyomissing, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1989, Ser. No. 373,316
Int. Cl.[5] C07D 311/82
U.S. Cl. 549—227 8 Claims

1. A compound of the formula



wherein R is hydrogen or linear or branched alkyl of 1 to 10 carbon atoms, n is an integer from 1 to 4, and X is an anion.

4,945,177

ANTIMICROBIALLY ACTIVE NITRILES AND THE PRODUCTION THEREOF

Horst-Juergen Krause; Hans-Theo Leinen, both of Duesseldorf, and Rudolf Lehmann, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP86/00220, § 371 Date Feb. 11, 1987, § 102(e) Date Feb. 11, 1987, PCT Pub. No. WO86/06369, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 16, 1986, Ser. No. 3,425
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514688
Int. Cl.[5] C07C 119/00; C07D 279/12, 265/30
U.S. Cl. 558—405 3 Claims

1. 2,2-Dibromo-3-oxonitriles of formula I

(I)

wherein R represents a straight chain or branched alkyl group with 5 to 21 carbon atoms, a cycloaliphatic group unsubstituted or substituted with at least one alkyl group, and having 3 to 6 ring carbon atoms, or a phenyl or naphthyl group unsubstituted or substituted with at least one alkyl group, alkoxy group, fluorine or bromine atom, or nitro group.

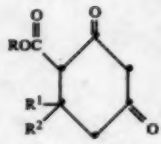
4,945,178

PREPARATION OF 4-CARBOALKOXY-1,3-CYCLOHEXANEDIONE TYPE COMPOUNDS

Charles A. McCombe, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 825,010, Feb. 3, 1986, abandoned. This application Feb. 24, 1989, Ser. No. 314,994
Int. Cl.[5] C07C 67/347
U.S. Cl. 560—125 5 Claims

1. The process for preparing a 4-carboalkoxy-5-[2-(alkylthio)-alkyl]-1,3-cyclohexanedione of the formula



comprising reacting an acetoacetic ester of the formula R—OOCCH$_2$COCH$_2$ with an unsaturated ester of the formula R^{1}R^{2}C=CHCOOR^3 in the presence of ethanolic sodium ethoxide catalyst, wherein:

R is ethyl;

R^1 and R^2 are each selected independently from: H; alkyl; cycloalkyl; alkyl substituted cycloalkyl; aryl, aryl substituted with alkyl of 1–6 carbons, alkoxy or 1–6 carbons, or halogen; heterocyclic; or heterocyclic substituted with alkyl of 1–6 carbons, alkoxy of 1–6 carbons, or halogen; with the provision that at least one of R^1 and R^2 is an alkylthioalkyl group and wherein the alkyl groups or moieties of R^1 and R^2 are 1–18 carbons; and

R^3 is alkyl of 1–6 carbons or cycloalkyl.

4,945,179

PROCESS FOR THE PREPARATION OF ESTERS OF CARBOXYLIC ACIDS AND CATALYTIC SYSTEM FOR USE THEREIN

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 15, 1988, Ser. No. 232,059
Claims priority, application United Kingdom, Sep. 28, 1987, 8722743
Int. Cl.[5] C07C 67/38
U.S. Cl. 560—233 9 Claims

1. A process for the preparation of esters of carboxylic acids which process comprises contacting an olefinically unsaturated compound with carbon monoxide and an alcohol in the presence of a catalytic system is prepared by combining:

component (a)—a ruthenium compound and

component (b)—lithium bromide and/or an onium bromide, wherein a molar ratio of carbon monoxide to olefinically unsaturated compound of not higher than 2.0 is used.

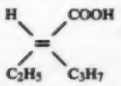
4,945,180

PROCESS FOR THE PREPARATION OF E-2-PROPYL-2-PENTENOIC ACID AND PHYSIOLOGICALLY COMPATIBLE SALTS THEREOF

Helmut Schäfer, Kayhyde, Fed. Rep. of Germany, assignor to Desitin Arzneimittel GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 203,291
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718803
Int. Cl.[5] C07C 51/377, 51/41, 51/08, 57/03
U.S. Cl. 562—599 7 Claims

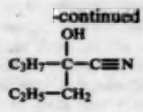
1. A process for the preparation of E-2-propyl-2-pentenoic acid of the formula:



(I)

or a physiologically compatible salt thereof using -di-n-propylketone-cyanohydrin of the formula:

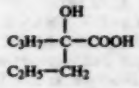
-continued



(II)

as the starting material, comprising the steps of:

(1) saponifying the compound of Formula II to form 2-hydroxy-2-propyl pentanoic acid of the formula:



(IV)

(2) reacting the compound of formula IV at a temperature of at least 200° C. with less than a stoichiometric quantity of a tertiary amine,

(3) separating the E-2-propyl-2-pentenoic acid formed in step (2) from the mixture; and, optionally

(4) converting the free acid obtained in step (3) into a physiologically compatible salt thereof.

4,945,181

METHOD FOR RESOLUTION OF RACEMIC THIAMPHENICOL PRECURSORS AND INTERMEDIATES THEREFOR

Helmut Dick, Frankenthal; Wolf-Dietrich Gradel, Ludwigshafen-Rachheim, and Mathias Weber, Mutterstadt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Dec. 1, 1986, Ser. No. 936,173

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543021

Int. Cl.[5] A61K *31/10*; **C07C** *147/10, 147/12, 147/14*

U.S. Cl. 564—212 **11 Claims**

1. A process for the preparation of thiamphenicol from D,L-threo-1-(p-methylsulphonylphenyl)-2-aminopropane-1,3-diol hydrochloride which is first converted to D,L-threo-aminodiolbenzal comprising

hydrolyzing the D,L-threo-aminodiolbenzal to D,L-threo-aminodiol.HCl;

separating D-threo-aminodiol.HCl from the D,L-threoaminodiol.HCl by selective crystallization by oscillating racemate resolution comprising alternating crystallization of D-Threo-aminodiol.HCl and of L-threo-aminodiol.HCl; and

converting D-threo-aminodiol.HCl to thiamphenicol.

4,945,182

OCULOSELECTIVE BETA-BLOCKERS

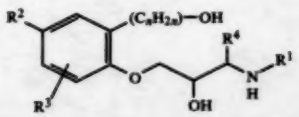
John J. Baldwin, Gwynedd Valley; David C. Remy, North Wales, and David A. Claremon, Audubon, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 813,324, Dec. 24, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,871

Int. Cl.[5] C07C *93/06*

U.S. Cl. 564—349 **3 Claims**

1. A compound of structural formula:



I

which includes the (R) and (S)-enantiomer, mixtures of the (S) and (R) enantiomers and the threo and erythro-diastereomers and the individual enantiomer thereof or an ophthalmologically acceptable salt thereof, wherein:

R^1 is t-butyl or isopropyl;

R^2 is C_{1-3}alkyl;

R^3 is hydrogen;

R^4 is hydrogen or C_{1-3}alkyl; and

n is 1–5.

4,945,183

PROCESS FOR THE PREPARATION OF 4-PHENYLQUINOL

Edward F. Moran, Jr., Wenonah, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1989, Ser. No. 443,376

Int. Cl.[5] C07C *45/28*

U.S. Cl. 568—309 **6 Claims**

1. A process for the preparation of 4-phenylquinol which comprises oxidizing at a temperature in the range of 20 to 90 degrees C., biphenyl dissolved in an organic solvent with an aqueous mixture of cerous methanesulfonate, ceric methanesulfonate and methanesulfonic acid, in which the mole ratio of cerous methanesulfonate to ceric methanesulfonate is in the range of about 0.2 to 50 mole percent, and the solvent is substantially inert with respect to the ceric methanesulfonate, the cerous methanesulfonate and the methanesulfonic acid.

4,945,184

PREPARATION OF UNSATURATED KETONES

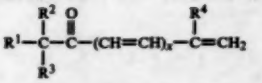
Joseph Pugach, McCandless Township, Allegheny County, and Jeffrey S. Salek, Oakdale Borough, Allegheny County, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 19, 1989, Ser. No. 367,902

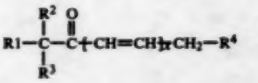
Int. Cl.[5] C07C *45/75*

U.S. Cl. 568—313 **15 Claims**

1. Method of making a compound of the formula



comprising reacting a ketone of the formula



with paraformaldehyde in the presence of a catalyst comprising a secondary amine in the form of a halogen acid salt, and a small amount of a carboxylic acid having up to about 15 carbon atoms in a ratio of amine catalyst to carboxylic acid of about 0.5:1 to about 10:1, where R^1, R^2, R^3 and R^4 are independently selected from hydrogen, alkyl and aromatic groups having 1 to about 15 carbon atoms including unsaturated groups provided that if both R^1 and R^2 are unsaturated, they should have a total of at least 4 carbon atoms, and also provided that R^1, R^2, R^3 and R^4 may form parts of the same carbon or heterocyclic ring which may have substitutions the total number of carbon atoms thereof being up to about 30, and x is 0 or 1.

4,945,185

PROCESS FOR PRODUCING MIXTURES OF KETONES AND ALDEHYDES

Anthony J. Papa, St. Albans, and David R. Bryant, S. Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 137,670, Dec. 24, 1987, abandoned. This application Dec. 5, 1989, Ser. No. 445,927

Int. Cl.[5] C07C *45/49*

U.S. Cl. 568—387 **17 Claims**

1. A hydrocarbonylation process for producing a mixture of a ketone and an aldehyde which comprises:

(I) forming a reaction mixture comprising:

(a) a catalytic amount of a complex catalyst consisting essentially of rhodium in complex combination with

(i) a triorganophosphine, and

(ii) a carboxylic acid selected from the group consisting of p-chlorobenzoic acid, p-fluorobenzoic acid and p-nitrobenzoic acid,

(b) an alpha-olefin having 2 to 5 carbon atoms inclusive,

(c) carbon monoxide, and

(d) hydrogen

with the proviso that the reaction mixture has a mole ratio of said carboxylic acid to rhodium of at least about 2; and a mole ratio of said triorganophosphine to rhodium not in excess of about 4; and

(II) maintaining the reaction mixture at a temperature and pressure at which said (b), (c) and (d) react to form a mixture of a ketone and an aldehyde.

4,945,186

METHOD OF PRODUCING 3-BROMOBENZALDEHYDE

Shinichi Matsuura, and Osamu Miyano, both of Shin-nanyo, Japan, assignors to Toso Organic Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 172,803, Mar. 28, 1988, abandoned. This application Jan. 2, 1990, Ser. No. 455,782

Claims priority, application Japan, Aug. 25, 1987, 62-211198

Int. Cl.[5] C07C *45/00*

U.S. Cl. 568—433 **10 Claims**

1. A method of producing 3-bromobenzaldehyde, comprising:

initially brominating benzaldehyde with molecular bromine in 1,2-dichloroethane solvent in the presence of a bromonating catalyst thereby producing the desired 3-bromobenzaldehyde product and unavoidably converting significant quantities of 1,2-dichloroethane solvent to 1,2-bromochloroethane and 1,2-dibromoethane;

recovering said 3-bromobenzaldehyde product and isolating the converted solvent containing brominating catalyst;

treating the converted solvent with molecular chlorine in the presence of brominating catalyst, thereby representing 1,2-dichloroethane solvent and molecular bromine; and

continuing the desired brominating reaction, which produces 3-bromobenzaldehyde, by the addition of molecular bromine and benzaldehyde to the regenerated solvent and molecular bromine.

4,945,187

PROCESS FOR PREPARING ENANTIOMERICALLY PURE PROPAN-1,2-DIOLS

Klaus R. Muller, Mannheim, Fed. Rep. of Germany, assignor to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 379,741

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1988, 3823787

Int. Cl.[5] C07C *29/36, 31/20, 29/76, 29/80*

U.S. Cl. 568—868 **8 Claims**

1. A process for preparing enantiomerically pure S(+)-propan-1,2-diol which comprises reacting L(−)-lactide with a reducing agent and then isolating the enantiomerically pure S(+)-propan-1,2-diol.

2. A process as recited in claim 1 which comprises the steps of:

(a) reacting L(−)-lactide with a reducing agent, in an inert first solvent at a temperature of between about 40° C. and about 70° C. to produce a first reaction mixture;

(b) hydrolysing the first reaction mixture with an aqueous solution of an alkali metal or alkaline earth metal, to form a second reaction mixture comprising an aqueous phase and an organic phase;

(c) separating the aqueous phase from the organic phase;

(d) separating out any aluminum hydroxide from the aqueous phase by precipitation;

(e) concentrating the aqueous phase by evaporation to produce a residue;

(f) suspending the residue in a second solvent to produce a suspension;

(g) filtering the suspension to remove solid reaction products;

(h) removing the second solvent from the filtered suspension to produce a filtrate; and

(i) purifying the filtrate by distillation, to produce an enantiomerically pure S(+)-propan-1,2-diol.

4,945,188

BUS SYSTEM

Raymond T. Jackson, Brighton East, Australia, assignor to Cableware Pty. Ltd., Australia

Filed Feb. 17, 1989, Ser. No. 311,828
Int. Cl.[5] H02G 5/06, 5/10
U.S. Cl. 174—16.2 6 Claims

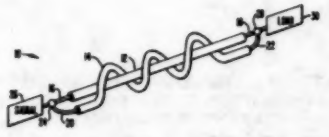
1. A bus duct including a plurality of bus bars stacked in substantially parallel flat-to-flat relationship within a housing, said bus bars having a joining means external of said housing, said housing comprising a first pair of walls each disposed one on either side, parallel to and longitudinally along said bus bars and a second pair of walls disposed transversely and longitudinally of said bus bars and fixed to said first pairs of walls to define a cavity within which said bus bars are accommodated, said first pair of walls and said bus bars being electrically insulated one from another by individual interposed sheets of separate insulating material, said second pair of walls and said bus bars being electrically insulated one from another by resilient insulation means disposed between the plurality of bus bars and the second pair of walls, each of said first pair of walls additionally including a plurality of integrally formed outwardly projecting longitudinally disposed cooling fins, said bus bars, insulating material of said interposed sheets and the resilient insulation means, and first pair of walls being held in intimate contact with one another to provide conductive heat transfer from said bus bars to said cooling fins and so that said bus bars are rigidly held along substantially their entire length by said housing.

4,945,189

ASYMMETRIC AUDIO CABLE FOR HIGH FIDELITY SIGNALS

Donald E. Palmer, #189 1275 Vicente Ave., Sunnyvale, Calif. 94086

Filed Aug. 9, 1989, Ser. No. 391,768
Int. Cl.[5] H01B 11/00
U.S. Cl. 174—32 11 Claims



1. An interconnection cable for audio frequency high fidelity applications for carrying a signal comprising:

a first conductor;

a second conductor disposed helically surrounding said first conductor and insulated from said first conductor;

said first conductor and said second conductor each having first ends electrically connected one another at a signal source and second ends electrically connected to one another at a load; and

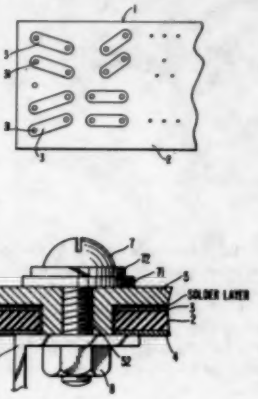
said second conductor having a physical length substantially longer than said first conductor such that signal length of said second conductor is substantially greater than signal length of said first conductor in order to minimize lengthwise end to end resonance.

4,945,190

CIRCUIT BOARD DEVICE FOR MAGNETICS CIRCUIT AND METHOD OF MANUFACTURING SAME

Yoshiki Fujioka, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00407, § 371 Date Nov. 16, 1988, § 102(e) Date Nov. 16, 1988, PCT Pub. No. WO88/08660, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 26, 1988, Ser. No. 276,453
Claims priority, application Japan, Apr. 28, 1987, 62-105979
Int. Cl.[5] H05K 1/00
U.S. Cl. 174—68.5 6 Claims



1. A circuit board device for a magnetic circuit for use in wiring an electrical circuit which handles a high current, said circuit board device comprising:

a printed circuit board including:

an electric insulator blank having openings formed therein penetrating both surfaces; and

circuit patterns of copper foil formed by an etching process on the surfaces of said electric insulator blank and over the openings in said electric insulator blank; and

short bars fastened to said circuit patterns of copper foil including said openings in said electric insulator blank for serving as conductor pieces for the high current, through-holes smaller in diameter than said openings in said electric insulator blank being provided in positions on said short bars corresponding to said openings, and peripheral end parts of said through-holes being burred into the openings to form secure mechanical and electrical connections.

4,945,191

CURLED ELECTRICAL CONDUCTOR CORD

Mamoru Satsuka, Osaka, and Hironobu Furusawa, Ohtsu, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 3, 1988, Ser. No. 227,679
Claims priority, application Japan, Aug. 5, 1987, 62-195867; Aug. 13, 1987, 62-202348; Sep. 29, 1987, 62-244686; Oct. 23, 1987, 62-268923; Nov. 25, 1987, 62-296889; Dec. 10, 1987, 62-313502; Jan. 23, 1988, 63-13444
Int. Cl.[5] H01B 7/06, 3/42
U.S. Cl. 174—69 14 Claims

1. An electrical conductor cord including a curled portion, said cord comprising at least one core wire and a sheath layer covering said core wire, said core wire having at least one conductor consisting essentially of at least one solid wire and covered with an insulating layer, said cord having a diameter

of at least 1 mm when circular in cross-section, or a cross-sectional area of at least 1 mm^2 when non-circular in cross section, said insulating layer consisting essentially of crystalline copolyester selected from the group consisting of polyester-polyester block copolymer and polyester-polyether block copolymer, said polyester-polyester block copolymer comprising crystalline aromatic polyester segments and polylactone

segments, said polyester-polyether block copolymer comprising crystalline aromatic polyester segments and aliphatic polyether segments, and said crystalline copolyester having a melting point of at least 180° C. and Shore D hardness of from 40 to 80, and wherein vertical stretch L_0 of the curled portion of said cord by its own weight is 30% or less and vertical stretch L_{50} of the curled portion of said cord under a load of 50 g is at least 200%.

4,945,192

CONNECTOR TERMINAL

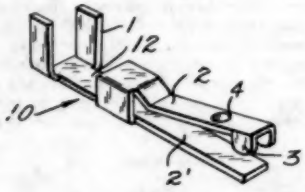
Kenichi Urushibata; Kiyoto Sugawara, and Haruo Saen, all of Tochigi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 6, 1989, Ser. No. 319,184

Claims priority, application Japan, Mar. 16, 1988, 63-34964[U]

Int. Cl.[5] H01R *11/01*

U.S. Cl. 174—94 R **15 Claims**



1. A connector terminal for connecting a first wire and a second wire comprising:

a base portion having first and second ends;

a first crimpable portion for securing said first wire to said first end of said base portion;

a clasping portion for connecting said second wire to said second end of said base portion, said clasping portion comprising:

a first spring portion having a first end and a second end, said first end of said first spring portion being connected to a middle portion of said base portion, and

a second crimpable portion disposed at said second end of said first spring portion for securing said first spring portion to said second end of said base portion, a second wire being disposed between said first spring portion and said second end of said base portion; and

a projecting portion projecting from said connector terminal toward said second wire.

4,945,193

GROMMET

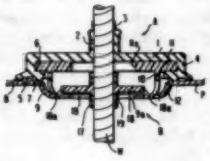
Ryuetsu Oikawa, and Akira Ikari, both of Shizuoka, Japan, assignors to Yazaki Corporation, Shizuoka, Japan

Filed Dec. 14, 1988, Ser. No. 284,289

Claims priority, application Japan, Dec. 16, 1987, 62-189967[U]

Int. Cl.[5] H01B *17/30*; H02G *3/22*

U.S. Cl. 174—153 G **4 Claims**



1. A grommet for sealing the clearance between a panel and an electric cord extending therethrough, comprising:

a locking portion made of a hard resin, said locking portion including a lower part having a center hole, an annular wall provided at the peripheral edge of said lower part a base plate provided at the top of said wall and having a center hole, and engaging tongues provided on said walls;

a soft portion including an annular recess fitted with said base plate, and a tube for receiving therethrough an electric cord; and

electric cord fastening members having stoppers dimensioned so as to be prevented from passing through said holes of said lower part and said base plate, said fastening members being securable to said cord so that said stoppers are located between said lower part and said base plate.

4,945,194

ELECTRIC MULTIPLE SWITCH ASSEMBLY WITH PUSHBUTTON ACTUATOR AND FORCE TRANSMITTING INSERT

Fritz Berger, Oberbuchsiten, Switzerland, assignor to Elektro-Apparatebau Olten AG, Olten, Switzerland

Filed Jan. 24, 1989, Ser. No. 301,611

Claims priority, application Switzerland, Feb. 1, 1988, 329/88-9

Int. Cl.[5] H01H *9/00, 13/50*

U.S. Cl. 200—5 R **15 Claims**

1. A pushbutton switch comprising a housing having a first section and a second section; a plunger movable in said first section between extended and depressed positions; switching means provided in said second section and including at least one first contact and at least one second contact; and means for engaging said second contact with said first contact in response to movement of said plunger to said depressed position, including a floating insert disposed in said housing between said plunger and said second contact, a pusher between said second

contact and said insert, means for biasing said pusher against said insert, and means for transmitting motion between said

insert and said plunger at n points wherein n is a whole number exceeding two.

4,945,195

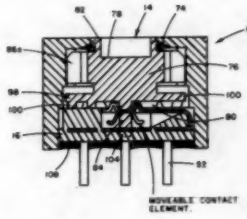
ROTARY SWITCH

Ralph Ipciuski, Hollis, N.H., assignor to C & K Components, Inc., Newton, Mass.

Filed Mar. 20, 1989, Ser. No. 325,392

Int. Cl.[5] H01H *19/60*

U.S. Cl. 200—6 B **6 Claims**



1. A DIP coded rotary switch comprising a housing, a rotor, a base, a fixed contact and a series of contact portions, the base formed by insert molding around a metal stamping, the metal stamping separated into the contact portions and the fixed contact, the base including a first long side edge, a second long side edge, a first side edge, a second side edge, an upper surface and a lower surface, the upper surface having a pair of spaced first and second ribs, formed in spaced parallel relation to each other and to the second long side edge, a pair of first channels being formed in the first rib extending from the first long side edge to a third channel and in spaced parallel relation with the first and a second side edges; the upper surface having a pair of spaced second channels formed in the second rib extending from the second long side edge to the third channel and being in spaced parallel relation with the first and a second side edges, each of the first and second channels having a floor and each of the floors being provided with a portion, the portion being wedge shaped in cross section, the third channel extending from first side edge to the second side edge, in spaced parallel relation with the first and second long side edges and in right angle relation with the first and second channels, each of the contact portions comprising a movable contact portion extending in integral, right angle relation to a support portion, each of the movable contact portions includes a free terminal end, the fixed contact portion positioned in the third channel with a movable contact portion positioned within each of the channels and each of the movable contact portions bent around the wedge shaped portion, the terminal end of each of the movable contact portions positioned in superimposed, spaced relation to the fixed contact portion, the rotor mounted within the housing in superposed relation to the upper surface of the base and to the terminal ends of each of the movable contact portions whereby rotation of the rotor urges one of the terminal ends into engagement with the fixed contact portion.

4,945,196

PROVIDING A PROGRAMMER/TIMER WITH DUAL RATE DRIVE

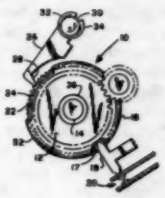
Joseph J. Mahon, Libertyville, and Robert K. Aigner, Chicago, both of Ill., assignors to Eaton Corporation

Continuation of Ser. No. 242,397, Sep. 9, 1988, Pat. No. 4,856,096. This application Jul. 28, 1989, Ser. No. 386,163

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] H01H *7/08*

U.S. Cl. 200—38 C **9 Claims**



1. A dual rate time-out electromechanical programmer for an appliance comprising:

(a) housing means;

(b) program means including shaft means mounted for rotation on said housing means and having at least one program track thereon;

(c) at least one appliance program function switch having a cam follower means responsive to said cam track for opening and closing said switch;

(d) first advance means operative upon receipt of power to drive said program cam means through a first frictional coupling and including a toothed member rotatably connected with said program cam means and a first driving means movably disposed on said housing means for movement between a first position drivingly engaging said toothed member and a second position drivingly disengaged from said toothed member;

(e) blocking means operative in response to user rotation of said shaft means and program cam means to a selected position, to move said first driving means to said second disengaged position;

(f) second advance means operative upon receipt of power, to continuously drive said program cam means through a second rotary frictional coupling, said second advance means operable to advance said program cam means at a rate significantly different from the rate of said first advance means;

(g) wherein said first advance means is operative to override said second rotary frictional coupling when said first driving means is in said first position.

4,945,197

HIGH TENSION CIRCUIT BREAKER INCLUDING A DIELECTRIC GAS USED FOR BLASTING

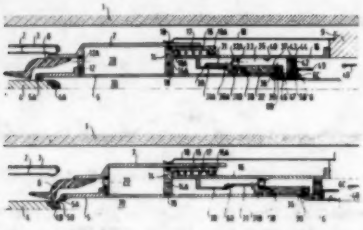
Edmond Thuries, Pusignan; Denis Dufournet, Bron, and Michel Perret, Tramole, all of France, assignors to Societe Anonyme dite: GEC Alsthom SA, Paris, France

Filed Sep. 11, 1989, Ser. No. 405,155

Claims priority, application France, Sep. 16, 1988, 88 12115

Int. Cl.[5] H01H *33/88*

U.S. Cl. 200—148 A **7 Claims**



1. A high tension circuit breaker having a dielectric gas under pressure, the circuit breaker being of the type including at least one circuit breaking chamber comprising an insulating envelope filled with said gas and containing a fixed assembly comprising a fixed main contact and a fixed arcing contact, and a moving assembly comprising in particular a moving main contact and a moving arcing contact, the circuit-breaking chamber further including a pair of secondary contacts and a blast cylinder opening out into a blast nozzle, wherein said blast cylinder is deliminted by a first cylinder constituting the moving arcing contact, a second cylinder constituting the fixed main contact, and a first piston sliding between said first and second cylinders, said first piston being urged by a spring to come into abutment against a part fixed to the fixed assembly, the cylinder constituting the moving arcing contact and a tube connected to the fixed assembly and coaxial with said cylinder together delimiting, on the other side of the piston closing the blast cylinder, a variable volume closed at one end by said first piston and at its other end by an annular end piston connected to said first cylinder and sliding along said tube, said volume enclosing said secondary contacts, a first secondary contact being fixed to said tube and the second secondary contact being entrained by said first cylinder.

4,945,198

HIGH TENSION CIRCUIT BREAKER WITH LOW OPERATING ENERGY

Edmond Thuries, Meyzieu; Denis Dufournet, Bron, and Michel Perret, Bourgoin-Jallieu, all of France, assignors to Societe anonyme dite: ALSTHOM, Paris, France

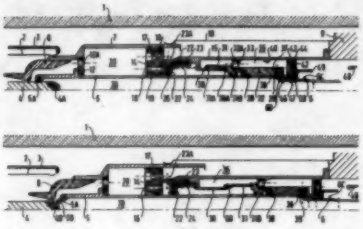
Filed Mar. 23, 1989, Ser. No. 327,883

Claims priority, application France, Mar. 23, 1988, 88 03803

Int. Cl.[5] H01H *33/88*

U.S. Cl. 200—148 A **9 Claims**

1. A high tension circuit breaker containing a dielectric gas under pressure, the circuit breaker being of the type comprising at least one interrupting chamber comprising an insulating envelope filled with said gas and containing a fixed assembly including a fixed main contact and a fixed arcing contact, and a moving assembly including a moving main contact and a moving arcing contact, the interrupting chamber also containing a pair of secondary contacts and a blast cylinder opening out into a blast nozzle, wherein the circuit breaker includes first means for limiting the maximum separation distance between the secondary contacts to a value which is less than the maximum separation distance between the arcing contacts, and



second means for preventing any arcs being struck during closure.

4,945,199

ELECTRIC DISCHARGE MACHINING METHOD AND DEVICE

Toshiaki Tanaka; Morihisa Nishikawa; Yoshio Ozaki; Kooji Akamatsu; Masahiro Nakata, and Atsushi Taneda, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

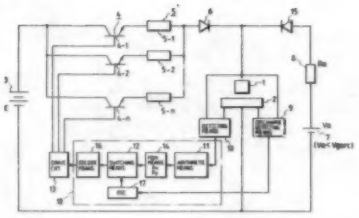
PCT No. PCT/JP87/00868, § 371 Date Aug. 25, 1988, § 102(e) Date Aug. 25, 1988, PCT Pub. No. WO88/03453, PCT Pub. Date May 19, 1988

PCT Filed Nov. 10, 1987, Ser. No. 231,820

Claims priority, application Japan, Nov. 14, 1986, 61-271061

Int. Cl.[5] B23H *1/02*

U.S. Cl. 219—69.13 **18 Claims**



1. An electric discharge machining method in which an electrically conductive solution is used as a machining solution, a pulse voltage is repeatedly applied between electrodes which are an electrode and a workpiece to be machined, to cause electric discharge to take place between said electrodes, thereby to machine said workpiece; in which

an interelectrode impedance Rgap defined by the distance between said electrodes, the confronting area thereof, and the specific resistivity of said electrically conductive solution is detected,

during a no-load period which is provided after application of said voltage between said electrodes until electric discharge takes place between said electrodes, a power source internal impedance Rx with which a no-load voltage equal to or higher than a discharge starting voltage is supplied is set,

after detection of the occurrence of electric discharge between said electrodes, a power source internal impedance Ry with which a desired machining current is supplied is set, and said machining current is allowed to flow for a predetermined period of time, and

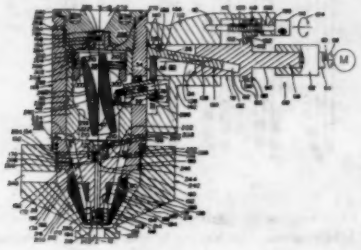
with a predetermined pause period, said series of operations are repeatedly carried out under control.

4,945,200

ELECTRICAL DISCHARGE MACHINE APPARATUS MOVING WIRE ELECTRODE GUIDE ASSEMBLY

Thomas J. Truty, South Barrington; William R. Fricke, Bloomingdale; James M. Ceriale, Green Oaks, all of Ill.; Jule L. French, Yoder, and Kevin M. Newell, Marion, both of Ind., assignors to Fort Wayne Wire Die, Inc., Fort Wayne, Ind. and T-Star Industrial Electronics Corp., Wheeling, Ill.

Filed Mar. 17, 1989, Ser. No. 325,284
Int. Cl.[5] B23H 7/10
U.S. Cl. 219—69.12 37 Claims



1. A guide assembly for guiding an electrical discharge machine apparatus moving wire electrode through a workpiece, said assembly comprising:

first, second and third guide members each having a bore for receiving the moving wire electrode therethrough and guiding the moving wire electrode;

a current pick-up between said second and third guide members in contact with the moving wire electrode and placing electric current thereon; and,

wherein said first guide member is to be located closest to the workpiece compared to said second and third guide member; and,

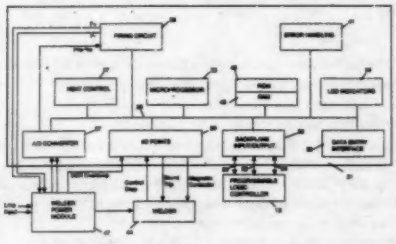
a post guide body having a wire passageway therethrough between first and second openings, said first guide member mounted to said body with said first guide member bore communicating with said passageway through said first passageway opening and said second guide member mounted to said body with said second guide member bore communicating with said passageway through said second passageway opening.

4,945,201

RACK MOUNTABLE WELD CONTROLLER

Roy A. Ito, Woodland Hills, and Wen-Tar Kuo, Chatsworth, both of Calif., assignors to Pertron Controls Corporation, Chatsworth, Calif.

Filed May 19, 1989, Ser. No. 354,509
Int. Cl.[5] B23K 11/24
U.S. Cl. 219—110 9 Claims



1. A rack mountable weld controller for controlling the operation of a welder having a welder power module for use in a programmable logic controller system including a card adapted for installation in a slot coupled through a backplane to a programmable logic controller, said card comprising:

a) a microprocessor;

b) backplane input/output means coupled to said microprocessor and for coupling to said backplane for transferring data between said programmable logic controller and said microprocessor;

c) input/output means coupled to said microprocessor and for coupling to said welder power module and said welder for transferring control signals between said welder power module, said welder and said microprocessor;

d) analog to digital converter means coupled to said microprocessor and for coupling to said welder power module for converting power line voltage and welder transformer primary current to digital signals;

e) means coupled to said microprocessor for generating a prefire signal;

f) firing circuit means coupled to said prefire signal generating means and said microprocessor and for coupling to said welder power module for generating a firing signal;

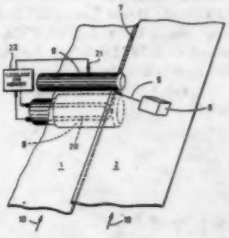
g) means for controlling the operation of said microprocessor.

4,945,202

METHOD OF AND APPARATUS FOR THE WELDING OF THIN SHEET METAL WORKPIECES

Bernd Büdenbender, Schubertweg 5, 2160 Stade, Fed. Rep. of Germany

Filed Jan. 19, 1989, Ser. No. 300,459
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1988, 3801365
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.63 16 Claims



1. A method of welding edge portions of thin sheet metal together, said method comprising the steps of:

(a) overlapping said edge portions of said thin sheet metal to form an overlap region of the thin sheet metal, said sheet metal having a certain thickness and said overlap region having a width of 0.3 to 8 times said thickness;

(b) training a laser beam on said overlap region for a period and of an intensity sufficient to heat and raise the temperature locally of said edge portions to a temperature above the melting point of the sheet metal; and

(c) pressing the heated edge portions together between tools having a spacing less than the sum of the thicknesses of said edge portions to form a seam between said edge portions of a thickness which is equal to said thickness of said sheet metal.

4,945,203

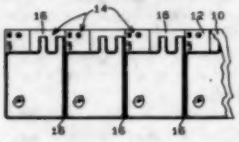
METHOD AND APPARATUS FOR MAKING FLUOROCARBON FILM PLASTIC BAGS USING A LASER

Charles I. Soodak, Silver Spring, and Robert R. Ulrich, Eldersburg, both of Md., assignors to American Fluoroseal Corporation, Silver Spring, Md.

Division of Ser. No. 927,542, Nov. 6, 1986, Pat. No. 4,847,462. This application Mar. 28, 1989, Ser. No. 329,836

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.64 56 Claims



1. A method of welding two plastic films together, comprising the steps of putting said films into optical contact with each other, and using laser means to weld said films together at locations where laser energy from said laser means strikes said films, said plastic films consisting of fluorocarbon films, and each having physical characteristics different from each other.

4,945,204

METHOD OF LASER-MARKING SEMICONDUCTOR DEVICES

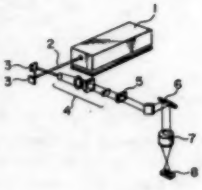
Masakatsu Nakamura, and Sayuki Hieda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 301,064, Jan. 25, 1989, abandoned. This application Oct. 19, 1989, Ser. No. 426,453

Claims priority, application Japan, Nov. 10, 1988, 63-282339

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.69 3 Claims



1. A method of laser-marking semiconductor devices comprising rectifying a pulsed laser beam to substantially the same size as that of a mask engraved with a mark such as a character or the like, passing the laser beam through said mask so that the beam takes the shape of said mark, and applying said laser beam to a resin surface of a resin sealed semiconductor device to engrave the resin with said mark, wherein

the energy density of said laser beam on the surface of said resin is 3 to 60 J/cm^2;

the pulse width of said laser beam is 0.1 ms or less, whereby said marking is performed.

4,945,205

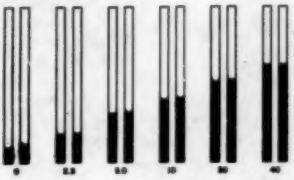
CHROMATOGRAPHIC STRIP HAVING NON-COMPRESSED EDGES

David Litman, Los Altos; Robert Zuk, Menlo Park, and Gerald Rowley, San Jose, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 599,386, Apr. 12, 1984, Pat. No. 4,756,828. This application Jul. 5, 1988, Ser. No. 215,198

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.72 2 Claims



1. In a method for preparing chromatographic strips from a sheet of bibulous material having bound thereto a member of a specific binding pair, the improvement which comprises cutting the longitudinal edges of said strips from said sheet by non-compressive cutting means.

4,945,206

BEAM BENDER FOR USE IN A LASER-BEAM MACHINING APPARATUS

Takeji Arai, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

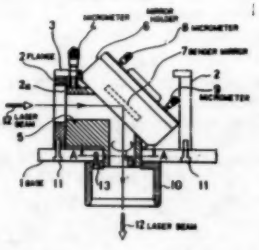
PCT No. PCT/JP88/00893, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/02336, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 3, 1988, Ser. No. 350,708

Claims priority, application Japan, Sep. 16, 1987, 62-231854

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.74 2 Claims



1. A beam bender for changing the direction of a laser beam in a laser-beam machining apparatus, comprising:

a base having a circular hole;

a removable flange screwed to said base;

a hollow light-guide member of an inverted L shape having one end rotatably inserted in said hole and an opposite end movably held against said flange whereby when said flange is removed from said base, said light-guide member may be rotated in said hole;

a mirror holder fixed to said light-guide member;

a bender mirror mounted on said mirror holder, said mirror holder having a fine adjustment mechanism for adjusting the angle of said bender mirror.

4,945,207

ASSIST GAS CONTROL METHOD

Takeji Arai, Yamanashi, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

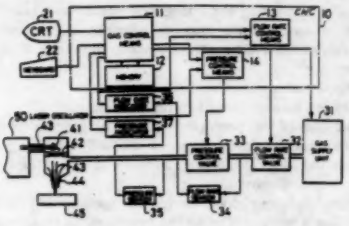
PCT No. PCT/JP88/00792, § 371 Date Mar. 21, 1989, § 102(e) Date Mar. 21, 1989, PCT Pub. No. WO89/01386, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 10, 1988, Ser. No. 332,936

Claims priority, application Japan, Aug. 12, 1987, 62-201599

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.84 6 Claims



1. An assist gas control method for a laser machining device including a combination of a laser beam machine and a numerical control apparatus, comprising the steps of:

indicating a kind, mixing ratio, pressure, and flow rate of an assist gas via instructions in a machining program; and

automatically controlling the kind, mixing ratio, pressure, and flow rate of the assist gas using said numerical control apparatus during laser machining operations.

4,945,208

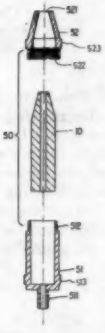
CARBON DIOXIDE WELDING GUN

Jon C. Lian, No. 8-3, Chong Shang E. Rd., Dan-Shuei, Taipei County, Taiwan

Filed Oct. 11, 1988, Ser. No. 255,462

Int. Cl.[5] B23K *9/12*

U.S. Cl. 219—137.61 1 Claim



1. In a carbon dioxide welding gun having a nozzle, the combination including:

(a) a front conical head member, said front conical head member having a through passage, said front conical member having an internal truncated conical configuration;

(b) a rear conduit member having a through passage, said rear conduit member being threadedly coupled to said front conical head member, said rear conduit member having a hollow cylindrical configuration defining a first male threaded connector portion at an upper section and a second male threaded connector portion at a lower section, said second connector portion having a diameter less than a diameter of said first connector portion;

(c) a welding contact tip member located within said nozzle of said welding gun and having an upper conical configuration for insert into mating and interfacing relation with said internal truncated conical configuration of said front conical head member, said front conical head member having a female threaded connector for threaded securement to said first male threaded connector of said rear conduit member, said combined front conical head member and said rear conduit member ing whereby said welding contact tip member is easily removed or inserted for operative efficiency.

4,945,209

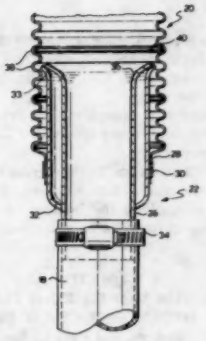
WELDING GUN SWIVEL

Robert N. Mann, Mississauga, Canada, assignor to Mig Vac Inc., Mississauga, Canada

Filed Nov. 13, 1989, Ser. No. 434,273

Int. Cl.[5] B23K *9/12*

U.S. Cl. 219—137.31 8 Claims



1. A welding gun, comprising:

a welding gun head for applying a weld to a site,

a conduit for conveying an electrical power cable to said welding gun head,

flexible bellows connector means connected at one end to said welding gun head, and

a generally elongate swivel connector means comprising two interacting parts arranged to swivel relative to one another about a longitudinal axis,

said swivel connector means having one of said interacting parts connected to the other end of said flexible bellows connector means and having the other of said interacting parts connected to said conduit.

4,945,210

CARD CONTROLLED SOLDERING IRON TEMPERATURE CONTROL DEVICE

Hiroshi Yoshimura, Osaka, Japan, assignor to Hakko Metal Industries Limited, Osaka, Japan

Filed Apr. 5, 1988, Ser. No. 177,696

Claims priority, application Japan, Nov. 18, 1987, 62-176117[U]

Int. Cl.[5] H05B *1/02*

U.S. Cl. 219—241 6 Claims

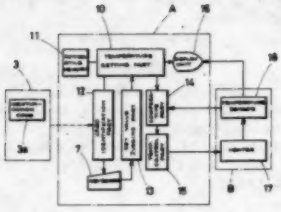
1. A soldering iron temperature control device capable of adjusting the set value of the temperature of a tip of a soldering iron having a heater for heating said tip, comprising:

card means having an identification code to identify a specific card holding person;

card identification means for identifying whether the card holding person is a selected person or not from the identification code of said card means and delivering a setting permit signal when the card holding person is identified to be the selected person;

input means for receiving the setting permit signal and entering the set value of said tip temperature;

set value judging means for judging whether the input numerical value from said input means is within an allowable temperature of the tip temperature or not;



memory means for storing the set value entered through said set value judging means;

temperature sensor means for detecting the tip temperature of the soldering iron;

comparative means for comparing the detected temperature of said temperature sensor means and the set value in said memory means; and

temperature control means for delivering a control signal on the basis of the result of comparison by said comparative means and controlling the heating of the heater of the soldering iron in response to said control signal.

4,945,211

APPARATUS FOR MONITORING TEMPERATURE DEPENDENT CHANGES

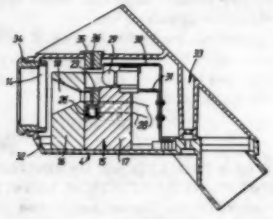
John F. Brooks, Billericay, and Paul L. Farnese, Southend-on-Sea, both of England, assignors to Electrothermal Engineering, Essex, England

Continuation of Ser. No. 871,519, Jun. 6, 1986, Pat. No. 4,808,796. This application Aug. 2, 1988, Ser. No. 227,144

Claims priority, application United Kingdom, Jun. 7, 1985, 8514384

Int. Cl.[5] H05B *3/70*

U.S. Cl. 219—385 **1 Claim**



1. An improved apparatus for monitoring temperature dependent changes in a substance, the apparatus having a heating arrangement including:

a plurality of preformed pieces of heat insulating material having a first volume;

a heat sink member having a second volume, the heat sink member being insulated by the pieces of heat insulating material and being perforated to provide an insertion passage having an open end for insertion of a sample tube of a substance to be heated;

electrical heating means for heating the heat sink member;

means for monitoring a change of a substance with temperature at a position in the insertion passage spaced from the open end of the insertion passage;

temperature detecting means for detecting the temperature of the heat sink member;

means for energizing the electrical heating means to provide a first relatively slow and controlled rate of temperature change over a range of temperatures in which the change is to be monitored; and

means for switching the energizing means to a relative fast rate of temperature change, whereby a substance may rapidly attain a temperature close to the range of temperature;

the improvement comprising:

the heating arrangement is a replaceable unit;

at least one of the preformed pieces includes a preformed recess, the preformed pieces mutually defining a heat insulating block containing a cavity in which the heat sink member is disposed;

the heat insulating block having an opening to provide access for a sample tube to the insertion passage; and

the second volume being less than the first volume, whereby the heat sink member has a relatively low thermal mass thereby enabling the heat sink to be heated rapidly.

4,945,212

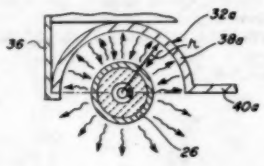
THERMAL RADIATION DEVICE

James M. Gogan, Brick, and Joseph Gialanella, N. Caldwell, both of N.J., assignors to Savory Equipment, Inc., Lakewood, N.J.

Filed Jul. 14, 1989, Ser. No. 380,613

Int. Cl.[5] F27D *11/00*

U.S. Cl. 219—388 **7 Claims**



1. A thermal radiation device comprising, in combination:

cylindrical rod means for radiating thermal energy;

elongate channel means having in cross section a semicircular concave reflecting surface of constant radius, said surface being coaxially juxtapositioned along the length of said rod means for redirecting substantially all of the energy radiated to said surface back to said rod means for increasing the temperature of said rod means;

whereby the rate of the nonreflected emitted by said rod means is increased.

4,945,213

SYSTEM FOR ISSUING TICKETS

Pierre Didiergeorge, Besancon, France, assignor to Schlumberger Industries, S.A., Montrouge, France

Filed May 9, 1988, Ser. No. 191,933

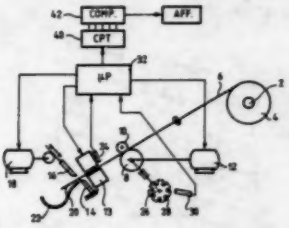
Claims priority, application France, Nov. 27, 1986, 86 16540

Int. Cl.[5] G07B *3/00*

U.S. Cl. 235—31 T **3 Claims**

1. A ticket-issuing system including a strip of paper having first and second main faces mounted on a support in order to dispense a plurality of tickets, said strip of paper including at least one mark on one of said main faces, the system including print means comprising an aperture for printing a ticket on the

strip, drive means for driving said strip to cause said strip to pass through said aperture of said print means cutter means for cutting off a part of the strip that has been printed from a remainder of the strip, said printed part of the strip cut corresponding to a ticket, detector means for detecting said mark to deliver a special detection signal in order to deduce information concerning a number of tickets remaining on the strip, means for generating a reference signal representative of a predetermined number of tickets, comparator means for comparing said predetermined number of tickets with the number of tickets remaining, and warning means for delivering a warning signal in response to said comparison.



4,945,214

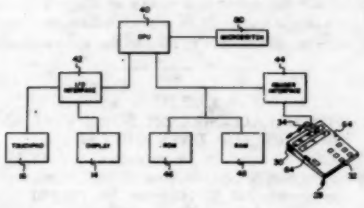
DIGITAL DATA APPARATUS WITH DATASTRIP COMPRESSION AND EXPANSION

David Hancock, and Thomas Bond, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,469

Int. Cl.[5] G06K 7/10

U.S. Cl. 235—456 **5 Claims**



1. Digital data apparatus comprising:

means for defining an elongated reading station at which one or more datastrips containing related digital information are to be read in sequence, each of said datastrips being formed of compressed, digitally encoded data in a plurality of parallel, contiguous lines of sequential bits, wherein the aggregate of said lines constitute the length of said strip and said lines run transversely of said strip, and wherein the number of bits in each line is identical but the number of bits encoding a character is variable in accordance with a predetermined compression/decompression code;

a datastrip reader which is mounted for movement along said reading station from a start position, in a first direction, to sequentially read said encoded bits in each line of said datastrip until all of said lines have been read and in a second opposite direction to return said reader to said start position;

a digital memory; and

control means for storing in said digital memory the encoded bits read from a datastrip by said reader as it moves in said first direction, until all of the bits of a datastrip have been stored in said memory; and while said reader moves in said second direction back to said start position, for decoding said encoded data according to said predetermined compression/decompression code and for storing said decoded data in said memory.

4,945,215

OPTICAL RECORDING CARD HAVING HOLOGRAM CONTAINED THEREIN AND METHOD OF PRODUCING THE SAME

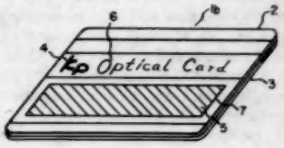
Yoichi Fukushima; Minoru Fujita; Yuji Kakinuma, and Toshio Haga, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,473

Claims priority, application Japan, Oct. 15, 1986, 61-244995; Oct. 24, 1986, 61-163468[U]

Int. Cl.[5] G06K 7/10

U.S. Cl. 235—457 **11 Claims**



1. An optical recording card having hologram contained therein comprising a transparent card front board of which inside surface includes a hologram portion building area and an optical recording portion building area superposed on said hologram portion building area, said hologram portion building area being formed with a pattern of concavity and convexity in the form of interference fringe of hologram, a reflective metallic film covering said pattern of concavity and convexity, said optical recording area including an optical recording pattern layer disposed between said reflective film and said pattern of concavity and convexity, said recording layer comprising a light absorbing material for frequencies outside the visible spectrum and a card rear board adapted to be adhered to said card front board from the above of said reflective metallic film and said optical recording pattern layer.

4,945,216

WIRELESS BAR CODE READER

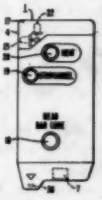
Takeshi Tanabe, Higashi Osaka; Kenzi Ide, and Mitsuo Obouchi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 308,962, Feb. 9, 1989, abandoned, which is a continuation of Ser. No. 855,087, Apr. 22, 1986, abandoned. This application Aug. 16, 1989, Ser. No. 395,203

Claims priority, application Japan, Nov. 6, 1985, 60-171615; Nov. 6, 1985, 60-171616; Nov. 6, 1985, 60-171617; Nov. 12, 1985, 60-174478

Int. Cl.[5] G06K 9/18; G06F 15/20

U.S. Cl. 235—462 **5 Claims**



1. A wireless bar code reader for transmitting to an elec-

tronic cooking device a signal representing a cooking routine, said bar code reader comprising

a scanning unit for reading bar codes and a light transmitting unit for simultaneously transmitting to a separate control unit a bar code light signal indicative of information related to a bar code read by said scanning unit, said scanning unit and said light transmitting unit being disposed at opposite ends in a longitudinal direction of said wireless bar code reader, said scanning unit being adapted to receive light in said longitudinal direction to read a bar code and said light transmitting unit being adapted to transmit light substantially perpendicularly to said longitudinal direction,

controlling means for controllably activating said scanning and light transmitting units, and

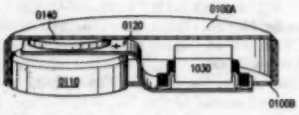
a read button and device control buttons disposed on one side surface of said bar code reader, said read button being disposed near said scanning unit, said device control buttons being disposed near said light transmitting unit, said read button serving to cause said controlling means to activate said scanning unit to read a bar code and to simultaneously cause said light transmitting unit to transmit a bar code light signal, and each of said device control buttons serving to cause said controlling means to activate said light transmitting unit to transmit a corresponding control signal for controlling an operation of said electronic cooking device.

4,945,217

HAND-HELD WAND FOR READING ELECTRONIC TOKENS

Michael L. Bolan, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed May 15, 1989, Ser. No. 352,598
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—472 **3 Claims**



1. A wand for rapidly manually contacting two-terminal thin round electronic token data modules, comprising:

a base shaped to be firmly supported by the hand of a user;

a surface positioned so that a user can bring said surface into contact with the token to be contacted,

said surface including a recess therein which is shaped to mate with the token to be contacted,

the inner perimeter of said recess being bordered by a conductive ring of conductive material,

said ring of conductive material being connected to a first lead wire;

an additional exposed contact, positioned substantially in the middle of said recess, said additional contact being connected to a second lead wire;

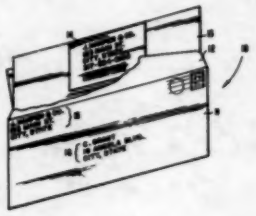
whereby said first and second lead wires can be connected to a host computer to provide a data interface to randomly positioned tokens, as quickly as a user can make contact between said recess and the respective tokens.

4,945,218

MAILING DEVICE AND MACHINE-READABLE BUSINESS CARD

Alex F. Talbott, 3703 Hillsdale Rd., Louisville, Ky. 40222

Filed Sep. 6, 1988, Ser. No. 240,796
Int. Cl.[5] G06K *19/00*
U.S. Cl. 235—487 **20 Claims**



1. A bar coded mailing combination with separable return label comprising:

a paper sheet including an addressor's section with a first portion to identify the addressor by name and address in written words printed on said addressor's section;

a removable paper sticker mounted atop and covering said addressor's section and having a bottom surface and an outwardly facing top surface, said sticker having a return section thereon printed on said top surface of said sticker and identifying the same addressor in pre-printed written words and in pre-printed machine readable bar code; and,

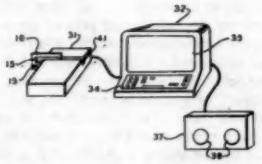
adhesive means on said bottom surface operable to allow said sticker to be removed from atop said addressor's section of said paper sheet by the addressee and to then mount said sticker onto a return envelope utilizing the identity of the addressor in pre-printed machine readable bar code on said sticker to mail to the same addressor.

4,945,219

COMPOSITE CALLING CARD FOR SOCIAL AND BUSINESS DATA AND USE

Masaki Tanaka, 10 Sarah Dr., Farmingdale, N.Y. 11735

Continuation of Ser. No. 80,884, Aug. 3, 1987, abandoned. This application Jul. 27, 1989, Ser. No. 388,300
Int. Cl.[5] G06K *19/02*
U.S. Cl. 235—488 **4 Claims**



1. A system for communicating information from one entity to another entity, said system comprising:

(a) a card reading means for reading and decoding encoded data on a calling card passed through said card reading means;

(b) a terminal coupled to said card reading means for receiving decoded data from said card reading means and for visually displaying said decoded data for visual presentation and for storing said decoded data for subsequent retrieval and display, said terminal including a cathode ray tube for visually displaying decoded data thereon and data

storage and retrieval means for storing said decoded data and for retrieving said decoded data; and,

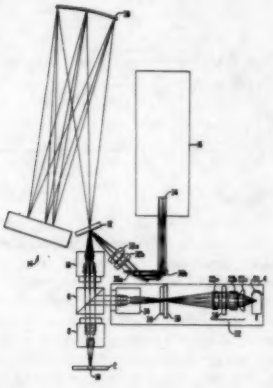
(c) said calling card having a front side and a back side bonded together forming a composite material calling card in disposible not destructible form, said front side being a paper material for accepting and retaining visible printed data thereon, said visible printed data being freely readable and defining social and/or business introduction information personal to an individual, said back side being an encodable material for accepting and retaining a virtually invisible encoded data defining business information, said encoded data being readable by said card reading means when said calling card is passed through said card reading means, said business information including business data, marketing data and marketing communications.

4,945,220

AUTOFOCUSING SYSTEM FOR MICROSCOPE HAVING CONTRAST DETECTION MEANS

Chester L. Mallory, Campbell; Phillip D. Wasserman, Cupertino; Hung V. Pham, San Jose, and Barry G. Broome, Glendora, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Filed Nov. 16, 1988, Ser. No. 272,597
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—201.3 27 Claims



1. Apparatus for focusing a microscope comprising:

means for projecting an area of varied light intensity through an objective of the microscope onto a specimen surface;

means for measuring light intensity of an image reflected from said surface at a plurality of locations, said plurality of locations lying substantially along a path passing through said area of varied light intensity;

means for determining a derivative of a factor related to said light intensity as a function of said location; and

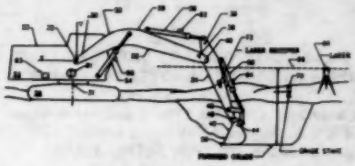
means for adjusting focus of said microscope until a variation in said derivative is substantially maximized.

4,945,221

APPARATUS AND METHOD FOR CONTROLLING A HYDRAULIC EXCAVATOR

Edward G. Nielsen, and Timothy E. Steenwyk, both of Grand Rapids, assignors to Laser Alignment, Inc., Grand Rapids, Mich.

Division of Ser. No. 42,449, Apr. 24, 1987, Pat. No. 4,829,418. This application Jun. 24, 1988, Ser. No. 210,803
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—203.1 10 Claims



1. A laser receiver comprising:

an array comprising a plurality of linearly aligned photoreceptors;

comparison means for determining the identity of said receptors that are receiving light at a predetermined frequency and above a predetermined level;

median detection means responsive to said comparison means for determining from among a group of said receptors that are determined to be receiving said light the receptor closest to the longitudinal center of said group; and

wherein said median detection means includes

means for assigning discrete number values to said photo receptors, said number values assigned consecutively longitudinally to adjacent receptors;

means for reading the number values assigned to the receptors receiving said light; and

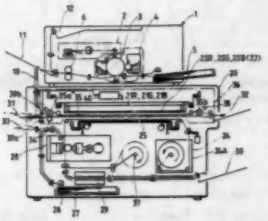
means for calculating the average value of said number values to produce a representation of the same receptor closest to the longitudinal center.

4,945,222

LIGHT IRRADIATION CONTROL DEVICE FOR USE IN IMAGE RECORDING APPARATUS

Toshio Sakai, and Michitoshi Akao, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 18, 1988, Ser. No. 259,341
Claims priority, application Japan, Oct. 20, 1987, 62-264830; Feb. 25, 1988, 63-42944
Int. Cl.[5] G01J 1/32
U.S. Cl. 250—205 9 Claims



1. A light irradiation control device for use in an image recording apparatus which includes an exposure unit including e light source, and a pressure developing unit, said image recording apparatus employing an image recording medium on which an image corresponding to an image of an original is provided, said device comprising;

a detection means for detecting one of light transmission factor of said image recording medium and thickness of said original and for generating an output signal indicative of one of said light transmission factor and said thickness prior to light application to said image recording medium; and,

a control means connected between said detection means and said light source for controlling light irradiation amount of said light source in response to said output signal, said light being firsty directed to one of said image recording medium and said original.

4,945,223

X-RAY IMAGE INTENSIFIER TUBE WITH CIRCUIT TO COMPENSATE FOR THE EFFECTS FO MAGNETIC DISTORTION

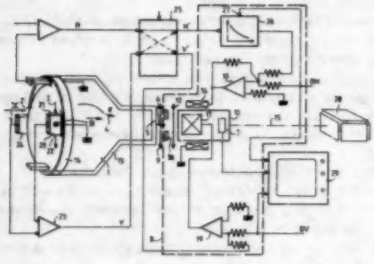
Jacques Beauzamy, Chatillon, France, assignor to General Electric CGR S.A., Issy les Moulineaux, France

Filed Jun. 29, 1989, Ser. No. 372,903

Claims priority, application France, Jul. 1, 1988, 88 08960

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—213 V T **9 Claims**



1. An X-ray image intensifier tube comprising:

a conversion panel to convert an X-radiation into an electronic radiation,

a screen to convert the electronic radiation into a light radiation,

a television camera provided with a target to detect the light radiation,

means for measuring magnetic disturbances, and a

and a circuit to compensate for distortion effects due to the magnetic disturbances, said circuit comprising:

a circuit to set the reading mode of the television camera target according to the measurement of the magnetic distortion.

4,945,224

OPTICAL WAVEFORM OBSERVING APPARATUS

Musubu Koishi; Etsuo Tsujimura; Motoyuki Watanabe, and Yutaka Tsuchiya, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 29, 1988, Ser. No. 291,825

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—213 VT **18 Claims**

1. Optical waveform observing apparatus comprising:

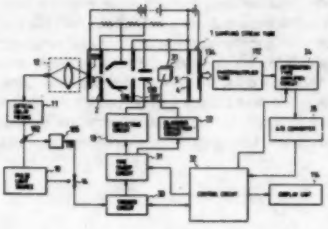
a sampling streak tube for observing a waveform of an incident light beam, the streak tube including means responsive to a repetitive deflecting trigger signal for deflecting in a sweep mode an electron beam corresponding to the incident light beam so that the electron beam can be sampled;

means for generating an electrical trigger signal having a predetermined repetitive frequency;

time sweep means for delaying by a predetermined time period said electrical trigger signal to provide said deflecting trigger signal;

integration means for integrating data outputted by said streak tube;

control means, operatively coupled to said time sweep means, for periodically generating a stop signal causing



said time sweep means to suspend provision of said deflecting trigger signal for a first time period; and

subtraction means, operatively coupled to said integration means, for subtracting the integration of the streak tube data outputted during said first time period from the integration of the streak tube data outputted during a second time period when said deflecting trigger is provided.

4,945,225

SIGNAL DISCRIMINATOR

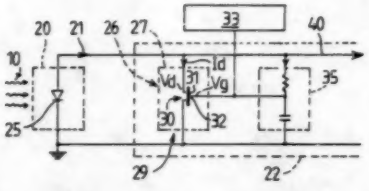
Christopher J. Gamgee, Carnegie; Peter Leigh-Jones, Vermont, both of Australia, and Charles Jungo, Saratoga, Calif., assignors to Amskan Limited, Oakleigh, Australia

Filed Sep. 16, 1988, Ser. No. 247,000

Claims priority, application Australia, Sep. 17, 1987, PI4408

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214 B **8 Claims**



1. A discriminating apparatus for discriminating a radiant information signal from a radiant background signal on which the information signal is superimposed, the discriminating apparatus including an incident radiation sensing means sensitive to an incident radiation signal comprising both the radiant information signal and the radiant background signal and operative to generate an output sensing signal of a level related to the intensity of the incident radiation signal, the sensing means having a variable operating point determining the operating characteristics thereof, and detector means responsive to the sensing signal to detect in the sensing signal a radiant information signal component superimposed on a background radiation signal component, the detector means operating so as to set the variable operating point of the sensing means, the sensing means being operative to convert the radiant information signal and the radiant background signal to electrical energy so as to thereby generate an output signal of a magnitude related to the incident radiation level which, in the absence of the detector means, is capable of reaching a saturation level of the output signal, any increase in incident radiation level beyond a radiation level necessary to produce said saturation level does not produce significant changes in magnitude of the output

sensing signal, the discriminating apparatus being operative over a range of radiant background signal intensities which could be sufficient in the absence of the detector means to cause the output signal to reach the saturation level without adjustment of the operating point of the sensing means, the radiation sensing means comprising a radiation sensitive semiconductor element operative in the photo-voltaic mode so as to produce as the output signal an output current which is dependent on the incident radiation intensity, the discriminating apparatus including a compensating circuit essentially powered by said output signal and operative in response to any variation in background radiation intensity level within a desired range to adjust the operating point of the incident radiation sensing means so as to maintain the level of the sensing signal below the saturation level and thus allow the sensing means and detector means to be responsive to a radiant information signal essentially independent of the level of the radiant background signal.

4,945,226

SEMICONDUCTOR PHOTOSENSOR AND DRIVING METHOD THEREFOR

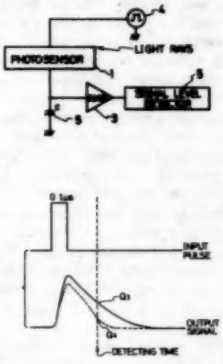
Takeshi Fukuda, Ebina; Nobumitsu Amachi, Atsugi; Mitsunori Sakama, Hiratsuka; Naoya Sakamoto, Atsugi, and Shunpei Yamazaki, Tokyo, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Oct. 27, 1988, Ser. No. 263,367

Claims priority, application Japan, Oct. 28, 1987, 62-274451

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—214 R **7 Claims**



1. A photosensor comprising:

a pulse generator;

a photosensitive semiconductor device coupled with said pulse generator in order to receive a pulsed signal from said pulse generator;

a charge storage means for accumulating charge in correspondence with the current passing through said semiconductor device; and

a signal level detector which detects charge accumulation level of said storage means a substantial time period, comparable to a discharge time of the charge storage means, after said semiconductor device receives the input pulse from said pulse generator in order to differentiate the charge accumulation levels corresponding to when said device is illuminated from that corresponding to when said device is not illuminated.

4,945,227

AVALANCHE PHOTODIODE QUENCHING CIRCUIT

Robin Jones, Worcester, and Kevin D. Ridley, Southampton, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

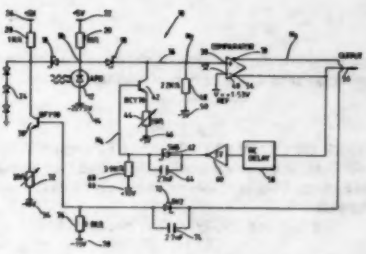
PCT No. PCT/GB87/00837, § 371 Date May 16, 1989, § 102(e) Date May 16, 1989, PCT Pub. No. WO88/04034, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 23, 1987, Ser. No. 359,754

Claims priority, application United Kingdom, Nov. 25, 1986, 8628110; Feb. 11, 1987, 8703105

Int. Cl.[5] G01J *1/44;* **H01L** *31/02;* **H04B** *9/00*

U.S. Cl. 250—214 R **14 Claims**



1. An avalanche photodiode quenching circuit including an avalanche photodiode and a comparator means having an input for detecting avalanche initiation by comparing photodiode potential with a reference potential said circuit comprising:

(a) a ballast resistor in series with and arranged for recharging the photodiode;

(b) a quenching circuit connected to the photodiode and arranged to reduce photodiode potential in response to avalanche detection by the comparator and to be deactivated by comparator reset;

(c) a reset circuit for resetting the comparator input after a preset delay activated in response to avalanche detection by the comparator and deactivated after a preset delay in response to comparator reset; and

(d) isolating means arranged to isolate the photodiode electrically from the quenching circuit during quiescence and recharge and from the reset circuit and comparator during quench and recharge.

4,945,228

INSPECTION OF CONTAINER FINISH

John W. Juvinall, Ottawa Lake, Mich., and James A. Ringlien, Maumee, Ohio, assignors to Owens-Illinois Glass Container Inc., Toledo, Ohio

Filed Mar. 23, 1989, Ser. No. 327,662

Int. Cl.[5] G01N *9/04*

U.S. Cl. 250—223 B **43 Claims**

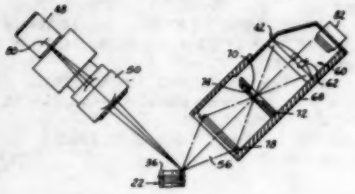
1. Apparatus for inspecting the finish of containers having a central axis and an open mouth surrounded by axially facing surface for sealing engagement with a container cap, said apparatus comprising:

means for rotating the container about its central axis,

a light source positioned to direct light energy onto the sealing surface of a container in said rotating means,

a camera that includes an array of light sensitive elements, said light source and said camera being positioned at respective acute angles to said sealing surface such that light energy from said source is directly reflected by said sealing surface to said camera, said camera having an effective field of view limited to an angular portion less than the entire circumference of the container sealing surface,

means for scanning said camera array at increments of container rotation to develop information indicative of intensity of light reflected by said sealing surface onto each said element as a function of said increments, and



means for detecting commercial variations in the container sealing surface as a function of said information.

4,945,229

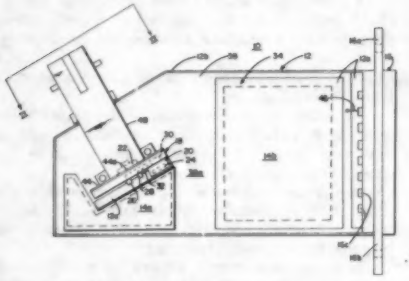
FIBER OPTIC RECEIVER AND TRANSCEIVER

C. David Daly, Whitehouse Station, N.J., and Ben Khoshnood, Coral Springs, Fla., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Dec. 29, 1988, Ser. No. 291,799

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.11 **15 Claims**



1. A fiber optic receiver having a sensor, a pre-amplifier and a post-amplifier, said receiver comprising:

(a) first printed circuit means having first surface for connection of said post-amplifier therewith and having matable connector means thereon for obtaining power for operation of said post-amplifier; and

(b) second printed circuit means supported by said first surface of said first printed circuit means in orthogonal geometric relation to said first circuit means and electrically connected therewith for obtaining power for operation of said pre-amplifier, said second printed circuit means having a first and a second surface, said pre-amplifier being mounted on said second printed circuit means first surface and electrically interconnected thereon, said sensor being mounted on said second printed circuit means second surface and electrically interconnected thereon;

said second printed circuit means second surface having a ground plane member thereon, said first printed circuit means first surface having a ground plane member thereon electrically continuous with said ground plane member of said second printed circuit means; and wherein said ground plane member of said first printed circuit means includes a spacing portion separating said post-amplifier from said second printed circuit means.

4,945,230

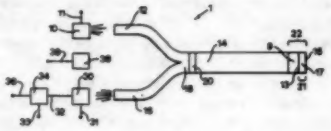
OPTICAL MEASURING DEVICE USING A SPECTRAL MODULATION SENSOR HAVING AN OPTICALLY RESONANT STRUCTURE

Elric W. Saaski, Bothell, and James C. Hartl, Woodinville, both of Wash., assignors to Metricor, Inc., Woodinville, Wash.

Continuation of Ser. No. 628,813, Jul. 6, 1984, Pat. No. 4,678,904. This application Jun. 4, 1987, Ser. No. 58,150

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.21 **27 Claims**



1. An optical measuring device for measuring a range of values for a sensed physical parameter, wherein said optical measuring device comprises:

light source means for emitting input measuring light of at least two wavelengths;

optically resonant structure means;

detection means; and

light transmission means;

wherein said optically resonant structure means has a reflectivity curve and a transmission curve, and has at least one operating segment on at least one of said reflectivity curve and said transmission curve;

wherein said optically resonant structure means has an optically sensitive physical characteristic which changes as a function of said sensed physical parameter; wherein said changes of said optically sensitive physical characteristic microshift said at least one operating segment as a function of said sensed physical parameter;

wherein said optically resonant structure means are for spectrally modulating said input measuring light as a function of said microshifts to produce spectrally modulated output light which is spectrally modulated as a function of said sensed physical parameter;

wherein said at least one operating segment is selected to be less than about one resonance cycle in length for said range of values for said sensed physical parameter; wherein said at least one operating segment is microshifted less than about one resonance cycle over said range of values for said sensed physical parameter;

wherein said wavelengths of said input measuring light are selected to fall at least substantially within said at least one operating segment over said range of values for said sensed physical parameter;

wherein said at least one operating segment and said wavelengths of said input measuring light are selected such that over said range of values for said sensed physical parameter said spectrally modulated output light bears a unique one-to-one relationship to said sensed physical parameter;

wherein said light transmission means are for conveying said input measuring light from said light source means to said optically resonant structure means and for conveying said spectrally modulated output light from said optically resonant structure means to said detection means;

wherein said detection means are for deriving two electrical signals corresponding to any two different portions of said spectrally modulated output light; and are for taking the ratio of said two electrical signals to provide an output measuring electrical signal which is a function of said sensed physical parameter, to null errors in the measurement of the sensed physical parameter and to help to maximize both the useable length and the useable microshift of said at least one operating segment over said range of values for said sensed physical parameter;

wherein said optically resonant structure means comprises a

body defining a cavity having a pair of opposed reflective surfaces; wherein at least one of said reflective surfaces bows as a function of said sensed physical parameter; and wherein said optically sensitive physical characteristic comprises the distance between said pair of opposed reflective surfaces and is a function of said bowing; and

wherein said sensed physical parameter comprises a sensed chemical species; wherein at least a portion of said body is permeable to said sensed chemical species; and wherein said cavity is at least partially filled with a sensitive media which is responsive to said sensed chemical species and which responds to said sensed chemical species by changing its volume to cause said bowing of said at least one of said reflective surfaces as a function of said sensed chemical species.

4,945,231

COMPOUND ROTARY ENCODER FOR DETECTING THE ROTATION ANGLE AND THE NUMBER OF ROTATIONS OF A ROTOR SHAFT

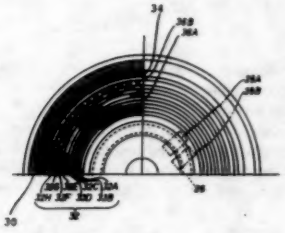
Hideshi Ohya; Takao Miyatani, both of Toyota; Keiji Kawamura, Chiryu, and Yasutomo Kawabata, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 1, 1989, Ser. No. 360,191

Claims priority, application Japan, Jun. 2, 1988, 63-136092; Jun. 2, 1988, 63-136094; Jun. 2, 1988, 63-136093; Jun. 3, 1988, 63-137890

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.14 **5 Claims**



1. A compound rotary encoder comprising:

(a) a timing-signal detecting means including,

(i) a timing code pattern on a rotating disk, and

(ii) a timing-signal determining portion for reading the timing code pattern and detecting a timing signal;

(b) an absolute-signal detecting means including,

(i) an absolute code pattern on the rotating disk,

(ii) an absolute-signal detecting portion on a fixed board for reading the absolute code pattern and detecting an absolute signal, and

(iii) an absolute-signal determining portion for detecting upper m bits of n-bit rotation-angle signal of a rotor shaft from the absolute signal, m being larger than one and less than n, and m and n being integers;

(c) an incremental-signal detecting means including,

(i) an incremental code pattern on the rotating disk,

(ii) an incremental-signal detecting portion on the fixed board for reading the incremental code pattern and detecting an incremental signal, and

(iii) an incremental-signal determining portion for counting the incremental signal from the incremental-signal detecting portion, detecting a counted value of the incremental signal, and for delivering the lower l bits of the n-bit rotation-angle signal, l being n minus m; and

(d) a timing control means for delivering the upper m bits of the n-bit rotation-angle signal and simultaneously initializing the counted value of the incremental-signal determining portion in synchrony with the timing signal.

4,945,232

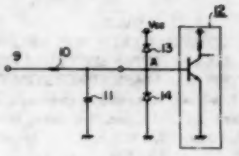
ANGLE MEASURING DEVICE

Masayuki Ikeuchi, and Kouichi Okamura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,646

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.14 **4 Claims**



1. An angle measuring device comprising:

a rotating disc adapted to rotate in synchronization with a crankshaft and having a plurality of slits formed along the circumference thereof;

a light-emitting means arranged in the vicinity of said rotating disc;

a light-receiving means adapted to receive light emitted from said light-emitting means through the slits of said rotating disc;

a signal processing circuit adapted to measure the turning angle of said rotating disc by processing signals output from said light-receiving means;

a power-source line for supplying power-source voltage to said signal processing circuit;

a first diode whose anode and cathode are connected to the input terminal of said signal processing circuit and to said power source line, respectively; and

a second diode whose anode and cathode are connected to a ground line and to the input terminal of said signal processing circuit, respectively.

4,945,233

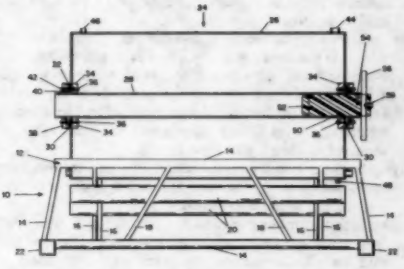
CALIBRATION AND QUALITY CONTROL SYSTEM FOR NEUTRON LOGGING INSTRUMENTS

Robert V. J. Jorro, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jul. 25, 1988, Ser. No. 223,325

Int. Cl.[5] G01V *5/10*

U.S. Cl. 250—252.1 **6 Claims**



1. Apparatus for calibrating a well logging instrument, comprising:

a cylinder containing an aqueous liquid solution having neutron moderating and absorbing properties,

an elongated tubular member disposed within said cylinder and adapted for receiving the well logging instrument

therein, said tubular member having preselected diameters to simulate a first calibration reference value for the well logging instrument, and

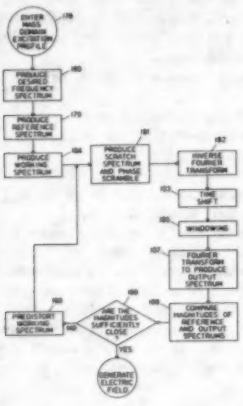
a plurality of rod members selectively insertable into said tubular member with the well logging instrument for selectively simulating a plurality of calibration reference values for said instrument, said rod members having a plurality of preselected diameters to simulate said plurality of calibration values.

4,945,234

METHOD AND APPARATUS FOR PRODUCING AN ARBITRARY EXCITATION SPECTRUM FOR FOURIER TRANSFORM MASS SPECTROMETRY

Seth Goodman, Madison, Wis., and Alan Hanna, Boulder, Colo., assignors to Extrel FTMS, Inc., Madison, Wis.

Filed May 19, 1989, Ser. No. 354,462
Int. Cl.[5] H01J 49/26
U.S. Cl. 250—291 42 Claims



1. Ion mass spectrometry apparatus comprising:

(a) an ion cell including a plurality of electrode plates;

(b) means for detecting motion of ions in the cell and providing a signal indicative thereof;

(c) means for producing a desired first discrete frequency spectrum;

(d) means for producing a first time domain waveform which is the inverse Fourier transform of the desired first discrete frequency spectrum followed by a time shift of half its length;

(e) means for producing a second time domain waveform which is the first time domain waveform multiplied by a window function, wherein the window function varies as a function of time from zero magnitude at the beginning and the end of the time domain waveform to a maximum magnitude level therebetween and has zero value over a segment at each end of the function;

(f) means for producing a second discrete frequency spectrum which is the forward Fourier transform of the second time domain waveform;

(g) phase scrambling means for producing a third discrete frequency spectrum which has the magnitude of the second discrete frequency spectrum with the phases of the discrete frequencies of the second discrete frequency spectrum varied as a non-constant function of frequency such that all discrete frequencies of the third discrete frequency spectrum are not in phase at any point in time and the group delays of the phase function are less than or equal to the length of the zero value segments of the window function;

(h) means for producing a third time domain waveform which is the inverse Fourier transform of the third discrete frequency spectrum followed by a time shift of half its length; and

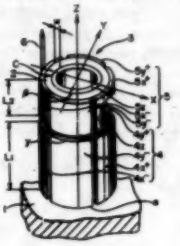
(i) excitation means connected to the ion cell for producing an electric field in the cell which corresponds to the third time domain waveform.

4,945,235

FINE ADJUSTMENT MECHANISM FOR A SCANNING TUNNELING MICROSCOPE

Tadashi Nishioka; Takao Yasue, and Hiroshi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 19, 1988, Ser. No. 233,741
Claims priority, application Japan, May 16, 1988, 63-116927
Int. Cl.[5] H01J 37/00
U.S. Cl. 250—306 14 Claims



1. A fine adjustment mechanism for a scanning tunneling microscope comprising:

a mounting member;

a cylindrical piezoelectric element having opposed first and second ends and opposed inner and outer walls, said element extending in a longitudinal direction between said ends and being fixed to said mounting member at said first end;

a probe disposed at the second end of said piezoelectric element;

an inner electrode disposed on the inner wall of said piezoelectric element; and

a plurality of outer electrodes disposed on the outer wall of said piezoelectric element, said outer electrodes being sectioned into a plurality of groups transverse to the longitudinal direction of said piezoelectric element.

4,945,236

DIRECT IMAGING TYPE SIMS INSTRUMENT HAVING TOF MASS SPECTROMETRIC MODE

Akinori Mogami, and Motohiro Naitoh, both of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,767
Claims priority, application Japan, Apr. 28, 1988, 63-107241
Int. Cl.[5] H01J 49/40
U.S. Cl. 250—309 5 Claims

1. A direct imaging type SIMS instrument comprising:

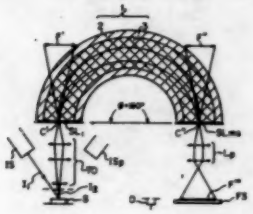
a beam source for producing a primary beam directed to a sample position to cause emanation of secondary ions from a sample at said position;

a mass analyzer into which are introduced the secondary ions emanating from the sample at the sample position, the mass analyzer comprising a magnetic field and a superimposed electric field perpendicular to the magnetic field; and

a first ion detector disposed at the output of the mass analyzer for displaying a two-dimensional direct image,

a second ion detector means for detecting a time-of-flight (TOF) spectrum, and

means for switching the mode of operation of the SIMS instrument between a direct imaging mode in which an image of the sample region irradiated with the primary



beam is focused onto the first ion detector and a time-of-flight (TOF) mass spectrometric mode in which the TOF spectrum is recorded at the second ion detector and in which the intensity of the magnetic field of the superimposed fields in the mass analyzer is reduced down to zero to only use the electric field.

4,945,237

TRANSMISSION ELECTRON MICROSCOPE

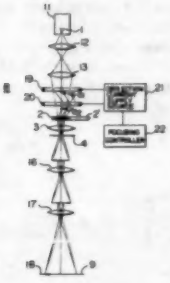
Kazuo Shii, Ibaraki; Toshiyuki Ohashi, Katsuta, and Hiroyuki Kobayashi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 343,750

Claims priority, application Japan, Apr. 28, 1988, 63-106195

Int. Cl.[5] H01V *37/27, 37/295*

U.S. Cl. 250—311 **8 Claims**



1. An electron microscope comprising:

means for generating an electron beam;

means for causing the electron beam to impinge upon a specimen, said electron beam producing transmitted main electron rays, inelastic scattering electron rays and diffractive scattering electron rays after passing through said specimen;

means for deflecting said electron beam before said electron beam impinges upon said specimen at a predetermined angle;

objective lens means for converging said electron rays from said specimen so as to form an image;

objective aperture means for normally cutting off said diffractive scattering electron rays so as to allow said transmitted main electron rays and said inelastic scattering electron rays to pass therethrough;

means for magnifying said image;

means for visually observing said magnified image; and

means coupled to said deflecting means, for controlling said deflecting means so as to deflect said electron beam before said specimen to a large deflecting angle by which said transmitted main electron rays and said inelastic scattering electron rays are cut off at said aperture means while said diffractive scattering rays alone is allowed to enter into said magnifying means through said aperture means so as to form a dark field image having high contrast, thereby focusing is made while said dark field image is observed through said observing means.

4,945,238

APPARATUS FOR LOADING SHEET-SHAPED MATERIAL

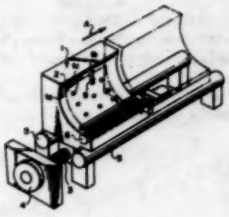
Katsuaki Muraishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 221,491, Jul. 19, 1988, abandoned. This application Jun. 27, 1989, Ser. No. 371,905

Claims priority, application Japan, Jul. 20, 1987, 62-180777

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—327.2 **3 Claims**



1. An apparatus for loading a sheet-shaped material, which comprises:

(i) a sheet holding means capable of holding a sheet-shaped material at a predetermined position on an inwardly concave curved surface,

(ii) a sheet conveyance means provided at an end portion of said sheet holding means for grasping said sheet-shaped material and conveying it to said predetermined position along said curved surface of said sheet holding means, and

(iii) a claw connected with an urging means, projected to a position on said curved surface at which a leading edge of said sheet-shaped material conveyed by said sheet conveyance means contacts said claw, and moveable on said curved surface against urging force of said urging means as the leading edge of said sheet-shaped material contacts said claw.

4,945,239

EARLY DETECTION OF BREAST CONCER USING TRANSILLUMINATION

Abund O. Wist; Ramendra N. Pandey, and Panos P. Fatouros, all of Richmond, Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Mar. 29, 1989, Ser. No. 330,136

Int. Cl.[5] G01N *21/27, 21/59*

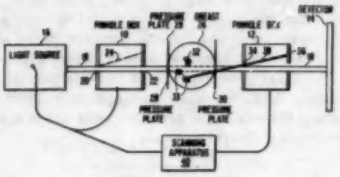
U.S. Cl. 250—358.1 **50 Claims**

1. A transillumination apparatus for the early detection of breast caner, comprising:

a source of nonionizing radiation for producing radiation in a specific frequency range, said nonionizing radiation having an intensity which permits passing through a breast;

an optical receiver for receiving radiation from said source

of nonionizing radiation which passes through said breast; and



a biochemical marker associated with cancer cells within said breast which absorbs radiation in said specific frequency range.

4,945,240

THERMAL IMAGING DEVICE

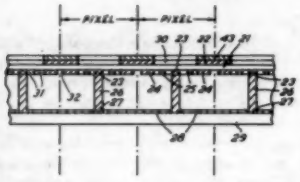
Elvin L. Nix, Windsor, and Stanley Taylor, Sunbury-on-Thames, both of England, assignors to Thorn EMI plc, London, England

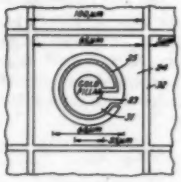
Filed Jun. 1, 1989, Ser. No. 359,880

Claims priority, application United Kingdom, Jun. 1, 1988, 8812955

Int. Cl.[5] H01L *27/146, 31/09*

U.S. Cl. 250—330 **10 Claims**





1. A thermal imaging device comprising: a layer comprising pyroelectric material; an array of inter-connected electrodes carried on one major surface of the layer; an array of discrete electrodes carried on the other major surface of the layer; a plurality of pillars effective to support the layer and to enable the passage of electrical signals between the discrete electrodes and an electrical signal processing means, each pillar being located on an electrical contact region within a nonelectroded region of said other major surface within a respective discrete electrode, the contact region and discrete electrode being electrically connected by a respective elongate region of electrically conductive material extending over said nonelectroded region.

4,945,241

POSITION-SENSITIVE RADIATION DETECTOR

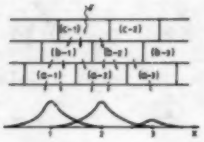
Takaji Yamashita, and Hiroshi Uchida, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka and Research Development Corporation of Japan, Tokyo, both of, Japan

Filed Mar. 7, 1989, Ser. No. 320,255

Claims priority, application Japan, Mar. 10, 1988, 63-57233

Int. Cl.[5] G01T *1/202*

U.S. Cl. 250—367 **9 Claims**



1. A position-sensitive radiation detector comprising:

a scintillator assembly having a plurality of scintillator layers arranged in a vertical direction, each layer comprising a plurality of scintillator blocks of rectangular solid form regularly arranged in a first horizontal direction, the scintillator blocks of each scintillator layer being staggered in the first horizontal direction with respect to the scintillator blocks of an adjacent scintillator layer;

reflection means disposed between adjacent ones of said scintillator blocks in a particular layer, for optically isolating said scintillator blocks;

coupling means disposed between adjacent ones of said scintillator layers, for optically coupling said adjacent ones of said scintillator layers;

position-sensitive photo-detecting means optically coupled to said scintillator assembly, for detecting scintillation light emanating from said scintillator assembly; and

computing means for determining, by calculation of the depth of a scintillation point in said scintillator assembly, a scintillation position in said first horizontal direction and in said vertical direction on the basis of an output signal from said position-sensitive photo-detecting means.

4,945,242

PHOTOSENSITIVE DEVICE AND IMAGE DETECTOR INCLUDING SUCH A DEVICE, ESPECIALLY TWO-ENERGY IMAGE DETECTOR

Jean-Luc Berger, and Marc Arques, both of Grenoble, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 22, 1989, Ser. No. 314,435

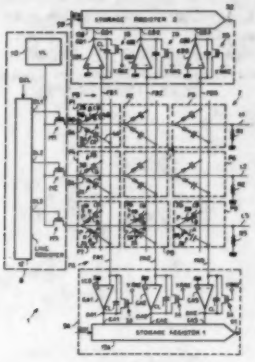
Claims priority, application France, Feb. 26, 1988, 88 02366

Int. Cl.[5] G01T *1/20*; H01L *31/10*

U.S. Cl. 250—367 **18 Claims**

1. An image detector comprising a photosensitive device including a matrix of photosensitive points (P1 to P9), the photosensitive points (P1 to P9) being connected to line conductors (L1 to L3) and to column conductors (FA1 to FA3, FB1 to FB3), wherein each photosensitive point (P1 to P9) includes a first and a second photosensitive cell (JA, JB) each capable of storing an information item, the two photosensitive

cells (JA, JB) being superposed; and a first and a second scintillator substance (27, 58) which are sensitive to different energies



of an incident radiation and emitting visible or non-visible light in response to the incident radiation.

4,945,243

MATRIX OF PHOTOSENSITIVE ELEMENTS AND RADIATION DETECTOR INCLUDING SUCH A MATRIX, ESPECIALLY DOUBLE-ENERGY X-RAY DETECTOR

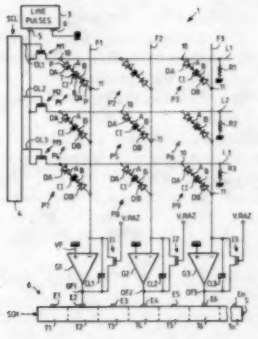
Marc Arques, Grenoble, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 22, 1989, Ser. No. 314,429

Claims priority, application France, Feb. 26, 1988, 88 02361

Int. Cl.[5] G01T *1/20*; H01L *31/10*

U.S. Cl. 250—367 **24 Claims**



1. A device for the conversion of images into electrical signals comprising a matrix of photosensitive elements including an array of line conductors (L1 to L3) and an array of column conductors (F1 to F3) and an array of photosensitive points (PI to P9), wherein each photosensitive point (P1 to P9) includes, between a line conductor (L1) and a column conductor (F1) two photosensitive elements (DA, DB) and a capacitor (CI), the two photosensitive elements (DA, DB) and the capacitor (CI) being connected in series, the two photosensitive elements being connected with directions of conduction which are opposite to one another; and a first and a second scintillator substance (27, 55) which are sensitive to differing energies of an incident radiation and which emit a light which is visible or near visible in response to the incident radiation.

4,945,244

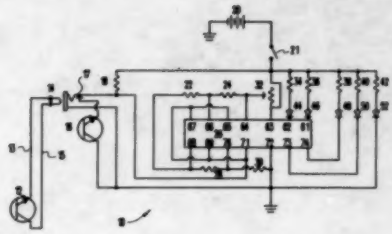
ELECTRONIC INFRARED DETECTOR

Robert D. Castleman, E. 1311 Glass, Spokane, Wash. 99207

Filed Dec. 23, 1988, Ser. No. 289,327

Int. Cl.[5] G01J *5/00, 5/10*

U.S. Cl. 250—370.01 **2 Claims**



1. A new and improved electronic infrared detector comprising:

a housing;

an integrated circuit in said housing;

a first phototransistor, sensitive to radiation in the infrared range, connected to said integrated circuit;

a battery in said housing operatively connected to said integrated circuit;

a series of light emitting diodes arranged in a bar graph like fashion in said housing;

a first connector in said housing;

a second phototransistor sensitive to radiation in the infrared range, said second phototransistor connected by elongated leads to a second connector for engagement with said first connector; and

means for deactivating said first phototransistor and for activating said second phototransistor upon engagement of said first and second connectors;

said integrated circuit including means for producing a plurality of discrete output voltages in response to changes in intensity of infrared radiation incident on said first or second phototransistor and transmitting said output voltages to each of said light emitting diodes in turn; and

said light emitting diodes operatively connected to said integrated circuit such that said light emitting diodes light up in sequence in response to progressively greater amounts of infrared radiation incident on said first or second phototransistor.

4,945,245

EVANESCENT WAVE BACKGROUND FLUORESCENCE/ABSORBANCE DETECTION

Herman W. Levin, 1919 Chestnut St. #2706, Philadelphia, Pa. 19103

Filed Jul. 14, 1988, Ser. No. 305,027

Int. Cl.[5] G01N *21/64, 33/551*

U.S. Cl. 250—461.2 **13 Claims**

1. A method for the optical analysis of a slurry, which slurry comprises:

(a) a continuous phase which comprises a component that fluoresces at an optically detectable wavelength, and

(b) a discontinuous phase which comprises a component that also fluoresces at said optically detectable wavelength,

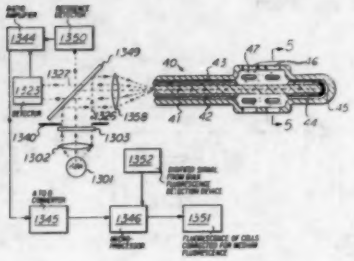
the method comprising the steps of:

(i) optically exciting said slurry with an evanescent wave having a wavelength that excites the fluorescence of said components and simultaneously

(ii) detecting the intensity of the fluorescence resulting therefrom, and then

(iii) relating said detected intensity of fluorescence to the

concentration of said component in said continuous phase, such that said detected intensity of fluorescence



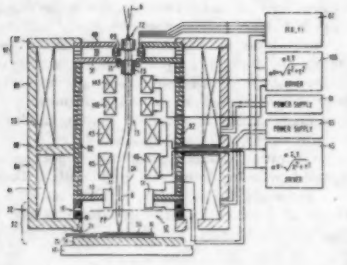
is independent of the concentration of the component in said discontinuous phase that also fluoresces.

4,945,246

TRI-DEFLECTION ELECTRON BEAM SYSTEM

Donald E. Davis; Cecil T. Ho, both of Poughkeepsie; Jon E. Lieberman, Montgomery, all of N.Y.; Hans C. Pfeiffer, Ridgefield, Conn., and Maris A. Sturans, Poughquag, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1989, Ser. No. 328,379
Int. Cl.[5] H01J 37/302
U.S. Cl. 250—492.2 **13 Claims**



1. Apparatus for scanning a shaped electron beam onto a target area, said area being subdivided into fields, said fields being subdivided into clusters, said clusters being subdivided into sub-fields, said sub-fields being subdivided into spots, comprising:

(a) means for scanning said electron beam in a said area such that said electron beam scans one field, and said beam is paused in this and subsequent ones of said fields;

(b) means for scanning said electron beam in a said field such that said electron beam scans one cluster and is paused in this and subsequent ones of said clusters; and

(c) means for scanning said electron beam in said one cluster such that said electron beam scans one sub-field and is paused in this and subsequent ones of said sub-fields,

(d) means for vector scanning said shaped electron beam from a said spot to another said spot within a said sub-field,

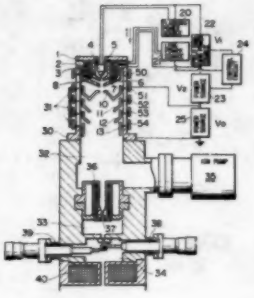
whereby scanning is performed hierarchically from field to field within an area, from cluster to cluster within a field, and from sub-field to sub-field within a cluster.

4,945,247

FIELD EMISSION ELECTRON GUN SYSTEM

Takeshi Kawasaki; Junji Endo, both of Kokubunji; Shigeto Isakozawa; Masahiro Tomita, both of Katsuta, and Akira Tonomura, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,827
Claims priority, application Japan, Jun. 17, 1988, 63-148105
Int. Cl.[5] H01J 37/073
U.S. Cl. 250—423 F **6 Claims**



1. A field emission electron gun system with a multi-stage acceleration tube comprising:

a source of field emission electrons;

a field emission electrode for extracting the electrons;

a magnetic lens having a magnetic gap between said field emission electron source and said field emission electrode or a magnetic lens having a magnetic pole which also serves as said field emission electrode;

an acceleration elecrtrode assembly including at least two stages of acceleration electrodes for accelerating the electrons;

current interlocking means for changing a magnetization current I for said magnetic lens interlocking with a voltage V_1 applied between said field emission electron source and said field emission electrode so that $IN/\sqrt{V_1}$ a predetermined value, N being the number of windings of said magnetic lens; and

voltage interlocking means for changing a voltage V_2 applied between said field emission electron source and the first-stage acceleration electrode of said acceleration electrode assembly interlocking with said voltage V_1 applied between said field emission electron source and said field emission electrode so that V_2/V_1 takes a predetermined value.

4,945,248

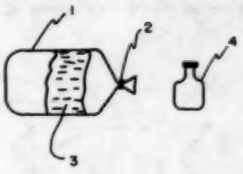
HYDROACTIVATED BIONIC INFRARED SOURCE

John F. Farr, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1989, Ser. No. 337,213
Int. Cl.[5] F21K 7/00
U.S. Cl. 250—493.1 **1 Claim**

1. A hydroactivated bionic infrared source including a biomass in a waterproof container, wherein said biomass includes desiccated micro-organisms and a dehydrated culture medium

for said micro-organisms, and means for releasing water in said container, whereby the release of water activates said micro-



organisms to begin rapidly consuming said medium and to emit infrared radiation.

4,945,249

REMOTE SENSING SYSTEM

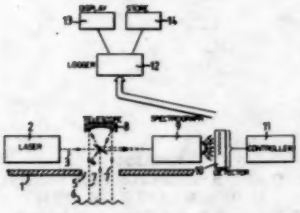
Andrew I. Grant, Surrey; Martyn T. MacPherson, Guildford, and David G. Stevens, Hampshire, all of England, assignors to The British Petroleum Company plc, London, England

Filed Jan. 5, 1989, Ser. No. 294,087

Claims priority, application United Kingdom, Jan. 12, 1988, 8800583

Int. Cl.[5] G01N *21/64*

U.S. Cl. 250—461.1 **11 Claims**



1. Apparatus for detecting an anomaly at or near a water or land surface which apparatus comprises means for generating a beam of primary light radiation, and directing the beam towards the surface, the beam being sufficiently intense and of such a spectral composition that the beam causes the anomaly, if present, to emit secondary light radiation, means for collecting the secondary light radiation, or means for collecting solar induced secondary light radiation, and spectral analysis means for analysing the spectrum of the secondary radiation, and a high resolution, multi-element digitising detector for detecting the analysed radiation, having a plurality of channels across the spectrum of the emitted secondary radiation, the channels being software configurable and under the control of a digitally addressable computer-operated controller, the concentration of used channels across the plurality of channels being adjustable and increasable in the regions of the spectrum of greatest interest and decreasable in the regions of least interest.

4,945,250

OPTICAL READ HEAD FOR IMMUNOASSAY INSTRUMENT

Mark S. Bowen, Medford; Stephen D. Fantone, Lynnfield, and Bruce E. Miller, Brighton, all of Mass., assignors to PB Diagnostic Systems, Inc., Westwood, Mass.

Filed Jul. 12, 1989, Ser. No. 378,649

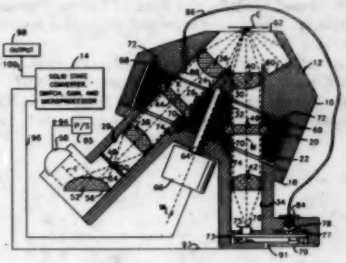
Int. Cl.[5] G01N *21/64*; G02B *26/04*

U.S. Cl. 250—461.1 **21 Claims**

1. Optical apparatus for use in analyzing the concentration of a constituent in a fluid sample by irradiating the sample with excitation energy within a first band of wavelengths, determining the amount of radiant energy emitted by the sample within a second band of wavelengths, and relating the amount of emitted radiation to the concentration of the constituent under investigation, said optical apparatus comprising:

a housing having an exterior surface and a pair of passages defining excitation and emission optical branches which intersect near said exterior surface to form an opening defining a read port in said housing,

a substantially cylindrical filter wheel journaled for rotation with respect to said housing, supporting at least one matched pair of excitation and emission bandpass filters, and having diametrically opposed opaque regions of suffi-



cient size to block the passage of light along each of said optical branches, said filter wheel having at least first and second working positions, each of said excitation and emission filters of said at least one matched pair, in said first position, being located in the excitation and emissions branches, respectively, and each of the excitation and emission branches being blocked by said opaque regions in said second position; and

means for optically isolating said excitation and emission optical branches from one another, said isolating means including light baffling means between said filter wheel and said housing.

4,945,251

GAS TARGET DEVICE

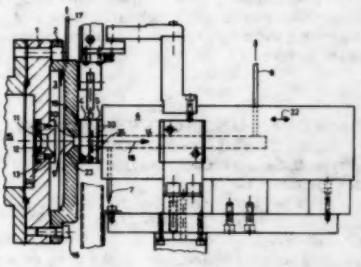
Volker Bechtold, Hagenbach, and Hermann Schweickert, Karlsruhe, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,024

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808973

Int. Cl.[5] H01J *37/08*

U.S. Cl. 250—492.1 **6 Claims**



1. A gas target device for bombarding a gaseous target with charged particles from a charged particle accelerator, said device having a vacuum chamber formed at its charged particle entrance end, said vacuum chamber having charged parti-

cle windows arranged opposite and in axial alignment with one another with metal foils sealingly extending across said windows which metal foils are translucent to said charged particles and a target chamber arranged adjacent said vacuum chamber and in axial alignment with the windows thereof so as to receive said charged particles passing through said vacuum chamber, said vacuum chamber forming a safety space between said target chamber and the adjacent vacuum system of said particle accelerator.

4,945,252

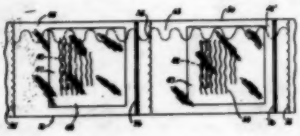
CONTINUOUS WEB REGISTRATION

Hershey Lerner, Hudson, and Bernard Lerner, Peninsula, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Continuation of Ser. No. 759,503, Jul. 26, 1985, Pat. No. 4,926,048, which is a continuation of Ser. No. 378,079, May 14, 1982, abandoned, which is a division of Ser. No. 166,500, Jul. 7, 1980, abandoned. This application Nov. 29, 1989, Ser. No. 443,705

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—548 **8 Claims**



1. A process of performing repetitive work operations on a multi-layered plastic web comprising:

(a) forming lines of weakness in the web to delineate a series of interconnected commodities;

(b) applying position locating indicia to an external surface of one layer of the web at spaced positions with at least one such indicia being applied to each commodity, the positions being selected to repetitively produce consistent spatial relationships between each such indicia and a web location where a work operation is to be performed;

(c) the indicia applying step including the substep of incorporation into each indicia transparent electromagnetic wave shifting material which when stimulated emits energy in a wavelength shifted range of an intensity relatively greater than the intensity but in the same wavelength range as the electromagnetic energy ambient to the web;

(d) directing electromagnetic energy to the indicia to cause the indicia successively to effect a wavelength shift and emit a relatively high intensity electromagnetic energy signal in said range;

(e) detecting the successive indicia signals with a detector while discriminating them from any ambient light reflections of like wavelength which are present; and

(f) separating a commodity from the web in response to said signal detections.

4,945,253

MEANS OF ENHANCING THE SENSITIVITY OF A GLOSS SENSOR

Allen Frohardt, San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Dec. 9, 1988, Ser. No. 282,102

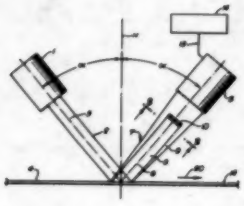
Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—571 **21 Claims**

1. A gloss sensor for determining the gloss of a surface, comprising:

a light source for emitting an incident light beam onto the surface, the source having an optical axis forming an angle, not equal to zero, with respect to a normal to the surface, thereby causing a light beam to be reflected from the surface, the reflected light beam having a specularly reflected component and a diffusely reflected component;

a light detector positioned to detect the reflected light beam including the diffusely reflected component falling beyond the outer edge of the specularly reflected component; and



light attenuating means, disposed in the path of the reflected beam at a point before the reflected beam reaches the light detector, for preferentially attentuating at least a portion of the specularly reflected component relative to the diffusely reflected component.

4,945,254

METHOD AND APPARATUS FOR MONITORING SURFACE LAYER GROWTH

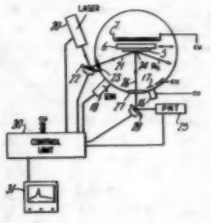
David J. Robbins, Malvern, Great Britain, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government for the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 21, 1988, Ser. No. 276,195

Claims priority, application United Kingdom, Mar. 19, 1986, 8606748; PCT Int'l Appl., Mar. 17, 1987, PCT/GB87/00187

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—571 **23 Claims**



1. A method of monitoring surface conditions on a surface of a subtrate being processed including the steps of:

directing a beam of light onto at least one portion of an area of the surface being monitored;

detecting light scattered from said at least one portion of an area in at least one non-specular reflection direction;

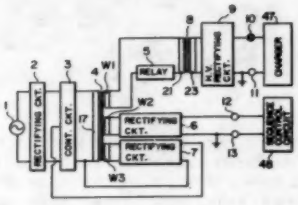
changing the process parameters in response to detected changes on said at least one portion of said area of said surface.

4,945,255

POWER SOURCE DEVICE

Koji Suzuki; George Nagahira, both of Yokohama; Kazuyoshi Takahashi, Kawasaki; Kunio Yoshihara, Tokyo; Toshiro Matsui, Kawasaki, and Tadashi Ishikawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 626,396, Jun. 29, 1984, abandoned.
This application Mar. 28, 1988, Ser. No. 175,571
Claims priority, application Japan, Jul. 5, 1983, 58-122046; Jul. 5, 1983, 58-122047; Jul. 5, 1983, 58-122048
Int. Cl.[5] H02S 3/00
U.S. Cl. 307—17 12 Claims



1. A power source device, comprising:

a first transformer having a primary winding to which an input power is to be applied and at least first and second secondary windings, wherein said first transformer is adapted to supply a low voltage output from its second secondary winding to a low voltage load through a low voltage rectifier;

a second transformer having primary and secondary windings, said primary winding of said second transformer being connected without rectification to said first secondary winding of said first transformer, wherein said second transformer is adapted to supply a high voltage output to a high voltage load through a high voltage rectifier; and

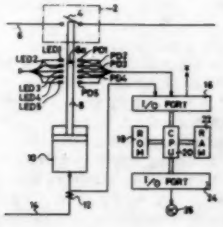
a switch, disposed between said first secondary winding of said first transformer and said primary winding of said second transformer, for connecting and disconnecting the high voltage output from said second transformer to the high voltage load.

4,945,256

DEVICE FOR PRODUCING EVEN CLOSING OF A CIRCUIT BREAKER

Shoji Tada; Toshiko Sugio, and Kuniaki Nakashima, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 215,955
Claims priority, application Japan, Jul. 9, 1987, 62-171481; Nov. 16, 1987, 62-289965; Jan. 21, 1988, 63-11206
Int. Cl.[5] H01H 47/00
U.S. Cl. 307—139 7 Claims



1. A circuit breaker, comprising:

at least one contact for opening and closing a phase of an electric power line;

an operation member for opening and closing said contact;

driving means for driving said operation member upon reception of a control signal;

control signal detecting means for detecting whether or not said control signal is applied to said driving means;

operation detecting means for detecting a movement of said operation member;

memory means for storing at least a regular control signal and a normal moving process of said operation member;

judging means for judging whether opening or closing operation of said contact is normally made or not, based on comparison among detected signals of said contol signal detecting means and said operation detecting means and said regular control signal and said stored data of said normal moving process of said operation member stored in said memory means; and

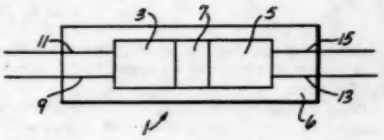
operation correcting means for correcting an abnormal state of said closing operation when said judging means detects an abnormal state of said contact, said moving member or said driving means.

4,945,257

ELECTRICALLY SETTABLE RESISTANCE DEVICE

Matthew L. Marrocco, III, Santa Ana, Calif., assignor to Maxdem Incorporated, Pasadena, Calif.

Continuation-in-part of Ser. No. 78,836, Jul. 28, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 274,442
Int. Cl.[5] G06G 7/06; H03H 11/00
U.S. Cl. 307—201 32 Claims



1. A device for providing an electrically settable resistance which comprises:

first and second electrodes, each comprising a redox active material;

an electrolyte between the electrodes;

a pair of terminals electrically connected to the first electrode at spaced-apart locations, the electrically settable resistance being defined between the pair of terminals, and being a function of the oxidation state of the first electrode; and

means, including a terminal electrically connected to the second electrode, for defining a control circuit path, including the first and second electrodes and the electrolyte, to enable a control current flowing through the control circuit path to change the oxidation state of the first electrode so that control current flowing in one direction sets the resistance of the first electrode to a lower value and control current flowing in the opposite direction sets the resistance of the first electrode to a higher value.

4,945,258

MONOLITHIC GAAS HIGH SPEED SWITCH DRIVER

Gary A. Picard, Langhorne, Pa., and Hayagriva V. Rao, Fairfield, Conn., assignors to Grumman Aerospace Corporation, Long Island, N.Y.

Filed Dec. 8, 1988, Ser. No. 281,394
Int. Cl.[5] H03K 3/01, 19/20, 19/092; H03L 5/00
U.S. Cl. 307—270 6 Claims

1. A high-speed switch driver circuit, comprising:

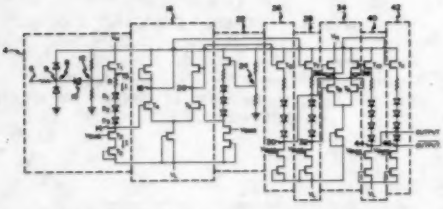
a reference input stage arranged to receive and process a

predetermined input signal and to output a reference signal;

an input stage arranged to receive and process an input signal and to produce an intermediate voltage level, including a first voltage level shift stage having means arranged to output a first voltage level shift signal, wherein the first voltage level shift signal voltage is less than the intermediate voltage;

a first differential amplifier stage, including means arranged to receive and process the first voltage level shift signal and the reference signal, and to output first and second first differential amplifier signals, said first of said first differential amplifier signals having a voltage level greater than or equal to zero and proportional to the difference between the first voltage level shift signal voltage and the reference signal voltage, and said second of said first differential amplifier signals having a voltage level less than or equal to zero and proportional to the difference between the first voltage level shift signal voltage and the reference signal voltage;

second and third voltage level shift stages, each including means arranged to receive and process a respective one of the first differential amplifier stage output signals and to



output a shifted differential amplifier signal having a voltage level shifted from the respective first differential amplifier signal;

a second differential amplifier stage, including means arranged to receive and process said shifted differential amplifier signals and to output two second differential amplifier signals, one said second differential amplifier signal having a voltage level greater than or equal to zero and proportional to the difference between the first shifted differential amplifier signal voltage and the second shifted differential amplifier signal voltage, and the other of said second differential amplifier signals having a voltage level less than or equal to zero and proportional to the difference between the second shifted differential amplifier signal voltage and the first shifted differential amplifier signal voltage; and

fourth and fifth voltage level shift stages, including means arranged to receive and process a respective one of the second differential amplifier stage signals and to output two switch state-determining voltage level signals, wherein said switch state-determining voltage level signals determine the on/off characteristics of a driven switch.

4,945,259

BIAS VOLTAGE GENERATOR AND METHOD

Thomas R. Anderson, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Nov. 10, 1988, Ser. No. 269,867

Int. Cl.[5] H03K *3/01;* **G05F** *3/16;* **H03F** *3/04*

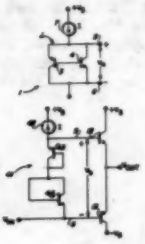
U.S. Cl. 307—296.1 **17 Claims**

1. A circuit for producing a reference voltage between a first terminal and a second terminal, comprising in combination:

(a) a first transistor having an emitter connected to the first terminal, a base, and a collector connected to the second terminal;

(b) a second transistor having an emitter connected to the second terminal, a base connected to the base of the first transistor, and a collector connected to the first terminal;

(c) a current source coupled to one of the first and second terminals for producing a first current in the first transistor



and a second current in the second transistor, a V_{BE} voltage of the first transistor and a V_{BE} voltage of the second transistor being thereby added to produce the reference voltage with a value equal to the sum of the amplitudes of the V_{BE} voltages of the first and second transistors.

4,945,260

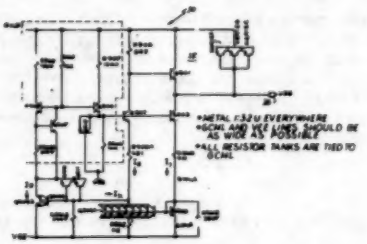
TEMPERATURE AND SUPPLY COMPENSATED ECL BANDGAP REFERENCE VOLTAGE GENERATOR

Kaneosh Naghshineh, Menlo Park, and David L. Campbell, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 17, 1989, Ser. No. 338,583

Int. Cl.[5] G05F *3/20*

U.S. Cl. 307—296.6 **10 Claims**



1. An ECL bandgap reference voltage generator for producing an output reference voltage V_{BB} that is compensated for variations in supply voltage, said bandgap generator comprising:

bandgap circuit portion means (12), including first and second parallel current branches connected between a first power supply potential and a second power supply potential, said first and second parallel current branches including first and second branch transistors, respectively, (Q902, Q903) for supplying current through the parallel branches, and a constant current source transistor (Q909) having its base coupled to the emitter of one of the first and second branch transistors and its emitter coupled to the second power supply potential, for establishing the output reference voltage B_{BB};

compensation circuit portion means (14), including a supply-independent current source connected between the first power supply potential and the collector of the constant current source transistor (Q909), for supplying constant current to the collector of the constant current source transistor (Q909) as variations in the supply voltage occur; and

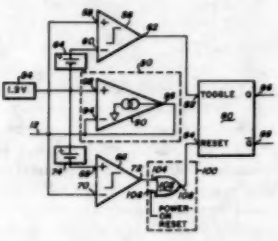
said supply-independent current source being formed of a first transistor (Q907), a second transistor (Q908), a first resistor (R903), a second resistor (R904), and a third resistor (R908), said first transistor (Q907) having its collector connected to the base of said second transistor (Q908) and coupled to the first power supply potential via the first resistor (R903), said first transistor (Q907) having its base connected to the emitter of said second transistor (Q908) and coupled to the collector of said constant current source transistor (Q909) via the first resistor (R904), said second transistor (Q907) having its emitter connected to the collector of said constant current source transistor (Q909), said second transistor (Q908) having its collector coupled to the first power supply potential via the third resistor (R908).

4,945,261

LEVEL AND EDGE SENSITIVE INPUT CIRCUIT

Michael E. Wright, Berkeley, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 27, 1989, Ser. No. 329,236
Int. Cl.[5] H03K 5/20
U.S. Cl. 307—443 **10 Claims**



1. An input circuit for receiving signals on an input line, and functioning to control the state of a memory element, said circuit comprising:

bias means comprising a transconductance amplifier coupled as a voltage follower to apply a bias voltage to said input line;

first comparator means coupled to set the state of said memory element when said input signals are a predetermined increment above said bias voltage; and

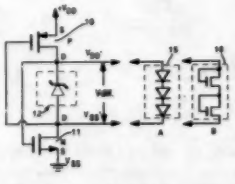
second comparator means coupled to reset the state of said memory element when said input signals are a predetermined increment below said bias voltage.

4,945,262

VOLTAGE LIMITER APPARATUS WITH INHERENT LEVEL SHIFTING EMPLOYING MOSFETS

Douglas S. Piasecki, Austin, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 26, 1989, Ser. No. 301,926
Int. Cl.[5] H03K 19/003
U.S. Cl. 307—451 **20 Claims**



1. A voltage limiting apparatus, comprising:

first and second power terminals for the application therebetween of an operating potential which may vary in amplitude;

a first field-effect transistor (FET) of a given conductivity type having a source, gate and drain electrode, and means for connecting said source electrode to said first power terminal;

a second FET of an opposite conductivity type to said first FET and having a source, gate and drain electrode, and means connecting said source electrode of said second FET to said second power terminal and

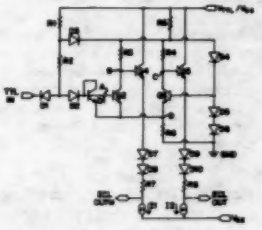
voltage clamping means connected between said drain electrodes of said first and second FETs, with the gate electrode of said first FET connected to the drain electrode of said second FET and with the gate electrode of said second FET connected to the drain electrode of said first FET to cause the voltage across said voltage clamping means to remain relatively constant notwithstanding variations in said operating potential.

4,945,263

TTL TO ECL/CML TRANSLATOR CIRCUIT WITH DIFFERENTIAL OUTPUT

Julio R. Estrada, South Portland, Me., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 23, 1989, Ser. No. 397,769
Int. Cl.[5] H03K 19/092
U.S. Cl. 307—475 **19 Claims**



1. A differential output TTL to ECL/CML translator circuit for delivering complementary ECL logic output signals in response to TTL logic input signals comprising:

a TTL input circuit for receiving TTL logic signals of high and low potential level;

a current mirror circuit comprising first and second current mirror branch circuits with a common emitter node coupling, said first and second current mirror branch circuits having a common base node coupling coupled to the TTL input circuit;

said TTL input circuit having bias circuit elements operatively coupled to the current mirror circuit for causing the first current mirror branch circuit to be substantially conducting and non-conducting respectively in response to TTL logic signal high and low potential levels at the TTL input circuit, said second current mirror branch circuit mirroring the current in the first current mirror branch circuit;

a differential amplifier gate comprising differential amplifier first and second gate transistor elements having emitter nodes coupled to said common emitter node coupling, and a current sinking bias feedback resistor element coupled to the common emitter node coupling, said differential amplifier first gate transistor element being the second current mirror branch circuit;

a threshold clamp circuit coupled to a base node of the differential amplifier second gate transistor element for applying a threshold voltage level, one of said first and second gate transistor elements being relatively conducting and the other being relatively non-conducting accord-

ing to the TTL logic input signal high and low potential levels applied at the TTL input circuit;

and complementary first and second ECL output circuits coupled respectively to collector nodes of the differential amplifier first and second gate transistor elements.

4,945,264

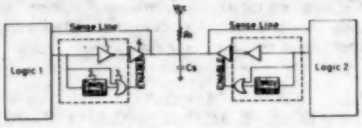
INTERFACE CONTROL CIRCUIT WITH ACTIVE CIRCUIT CHARGE OR DISCHARGE

Kun-Ming Lee, Taipei, and Ching-Dong Hwang, Keelung, both of Taiwan, assignors to Acer Incorporated, Taipei, Taiwan

Filed Feb. 22, 1989, Ser. No. 314,333

Int. Cl.[5] H03K *19/092, 19/00*

U.S. Cl. 307—475 **6 Claims**



1. An interface control circuit for handshaking between logic circuits comprising:

buffer means having at least an input terminal, an output terminal coupled to a potential source through a resistive element, and an ENABLE line;

an inverter having an input terminal and having an output terminal connected to the input terminal of the buffer means;

an OR gate having one input terminal connected to the input terminal of the inverter and an output terminal connected to the ENABLE line of the buffer means; and

delay means having an input terminal connected to the input terminal of the inverter and an output terminal coupled to another input terminal of the OR gate.

4,945,265

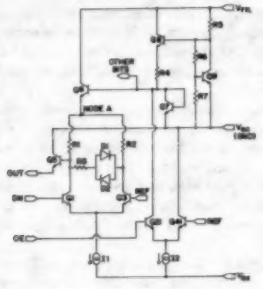
ECL/CML PSEUDO-RAIL CIRCUIT, CUTOFF DRIVER CIRCUIT, AND LATCH CIRCUIT

Julio R. Estrada, South Portland, Me., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 13, 1989, Ser. No. 379,088

Int. Cl.[5] H03K *19/086*

U.S. Cl. 307—455 **19 Claims**



1. An emitter coupled logic or current mode logic (ECL/CML) circuit having a differential gate or buffer coupled between relatively high and low potential level power rails comprising:

a pseudo-rail circuit coupled between the differential gate and said high potential level power rail, said pseudo-rail circuit comprising a pseudo-rail node, a first clamp circuit coupled to the pseudo-rail node for clamping said pseudo-rail node substantially at a first potential level in response to a first control signal, and a second clamp circuit coupled to said pseudo-rail node for clamping said pseudo-rail node at a second potential level below said first potential level in response to a second control signal.

4,945,266

COMPOSITE SEMICONDUCTOR DEVICE

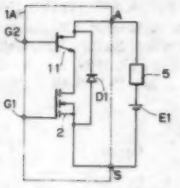
Satoshi Mori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,997

Claims priority, application Japan, Nov. 18, 1987, 62-292707; Dec. 3, 1987, 62-308081

Int. Cl.[5] H03K *17/60, 3/35/17/72*

U.S. Cl. 307—570 **17 Claims**



1. A composite semiconductor device, comprising;

first and second power source terminals for receiving first and second power source potentials, respectively;

first and second control signal input terminals for receiving first and second control signals, respectively;

a static induction type element having a first electrode connected to said first power source terminal, a control electrode connected to said first control signal input terminal and a second electrode;

a MOS field effect transistor having a first electrode connected to said second electrode of said static induction type element, a second electrode connected to said second power source terminal and a control electrode connected to said second control signal input terminal; and

a diode having an anode connected to the second electrode of said MOS field effect transistor and a cathode connected to one of the non-control electrodes of said static induction type element.

4,945,267

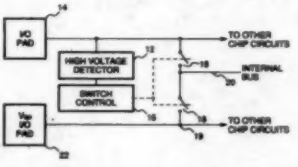
INTEGRATED CIRCUIT BUS SWITCHING CIRCUIT

Douglas C. Galbraith, Fremont, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Filed Jan. 10, 1989, Ser. No. 295,402

Int. Cl.[5] H03K *17/687, 3/26;* **G05F** *1/40*

U.S. Cl. 307—571 **2 Claims**



1. An integrated electronic circuit for selectively switching a bi-directional, low resistance circuit path between an internal bus in an integrated circuit and an input/output pad of said integrated circuit and a circuit node in said integrated circuit, including

a first MOS switching transistor connected between said input/output pad and said internal bus,

a second MOS switching transistor connected between said circuit node and said internal bus,

high voltage detection means for detecting whether the voltage on said input/output pad is above a preselected threshold level,

switch control means responsive to said high voltage detection means, for activating said first switching transistor if high voltage is present at said input/output pad, and for activating said second switching transistor if high voltage is not present at said input/output pad, said switch control means adapted to limit current flow from said input/output pad to said internal bus until the potential difference between said input/output pad and said internal bus is less than a predetermined amount,

means, coupled with said switch control means, for preventing said first and said second switching transistors from being activated at the same time.

4,945,268

PERMANENT MAGNET TYPE LINEAR PULSE MOTOR

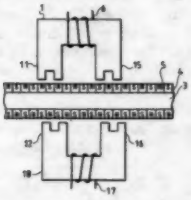
Hideki Nihei; Kunio Miyashita, both of Hitachi, and Hideki Asano, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,123

Claims priority, application Japan, Dec. 26, 1987, 62-333529; Dec. 26, 1987, 62-333530

Int. Cl.[5] H02K *41/00*

U.S. Cl. 310—12 **22 Claims**



1. A permanent magnet type linear pulse motor comprising a plurality of N and S permanent magnetic poles which are disposed alternatively and in a constant pitch T along a longitudinal direction of at least two surfaces of a mover; a plurality of first phase stator magnetic poles which are wound by a same phase coil to form a pair of magnetic poles, each of said stator magnetic poles having teeth whose pitch is equal to said constant pitch T of said permanent magnetic poles, said stator magnetic poles being disposed at a predetermined distance in relation to said at least two surfaces of said mover; and a plurality of second phase stator magnetic poles having the same structure as said plurality of first phase stator magnetic poles, wherein said plurality of first phase stator magnetic poles and said plurality of second phase stator magnetic poles are disposed so as to have a delay of T/2 pitch, respectively, with respect to said pitch T of said plurality of N and S permanent magnetic poles, and wherein each of said plurality of first and second phase stator magnetic poles have respective teeth opposingly arranged with respective magnetic poles of a first polarity on a first surface of said mover and of a second polarity on a second surface of said mover.

4,945,269

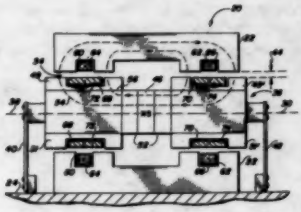
RECIPROCATING ELECTROMAGNETIC ACTUATOR

Lawrence J. Kamm, San Diego, Calif., assignor to Science Applications International Corporation, San Diego, Calif.

Filed Jan. 26, 1989, Ser. No. 303,531

Int. Cl.[5] H02K *33/12*

U.S. Cl. 310—15 **37 Claims**



33. A reciprocating electromagnetic actuator comprising:

a reciprocator formed of a ferromagnetic material;

a stator also formed of a ferromagnetic material, the reciprocator being mounted for reciprocal motion relative to the stator;

means for generating a constant magnetic flux that passes through the stator and reciprocator;

a first coil disposed in the reciprocator through which a first current is passed, said first current creating a first magnetic flux that subtracts or adds to said constant magnetic flux; and

a second coil disposed in the stator through which a second current is passed, said second current creating a second magnetic flux that offsets the first magnetic flux, whereby the total magnetic flux passing through the stator and reciprocator remains constant.

4,945,270

MOISTURE DRAIN STRUCTURE FOR A DYNAMOELECTRIC MACHINE AND MANUFACTURING METHOD THEREFOR

Kyoichi Okamoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

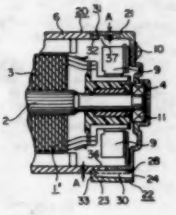
PCT No. PCT/JP88/00135, § 371 Date Oct. 11, 1988, § 102(e) Date Oct. 11, 1988, PCT Pub. No. WO88/06368, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 10, 1988, Ser. No. 265,810

Claims priority, application Japan, Feb. 13, 1987, 20164

Int. Cl.[5] H02K *5/00, 15/14*

U.S. Cl. 310—88 **4 Claims**



1. A moisture drain structure for a dynamo-electric machine having a housing comprising:

a first housing section having an outer spigot joint element including an internally reduced thickness portion of said first housing section, and a second housing section having an inner spigot joint element including an externally reduced thickness portion;

a moisture drain conduit integral with a bottom wall of said first housing section and defining therein a moisture drain channel extending substantially horizontally along the bottom wall, a first end of the drain channel extending into and in communication with an inner surface of the internally reduced thickness portion of said outer spigot joint element, and a second end of the drain channel being open to the exterior of the housing;

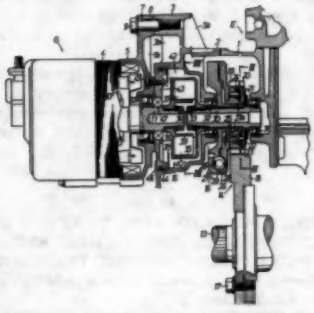
the inner spigot joint element having an axial dimension shorter than the outer spigot joint element at least at a position corresponding to the first end of the drain channel.

4,945,271

SUPPORTING DEVICE FOR GENERATOR ON ENGINE

Noboru Yokoya, and Hajime Tabata, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 219,726
Claims priority, application Japan, Jul. 7, 1987, 62-104070[U]
Int. Cl.[5] H02K *5/24*; F16D *3/68*
U.S. Cl. 310—91 **9 Claims**



1. The combination comprising:

an engine having an engine body including a side casing and a crankshaft operable in said engine body;

a generator including a stator and a rotatably mounted rotor having a rotor shaft concentrically disposed within said stator;

means for mounting said generator to said side casing of said engine body; and

means for operatively connecting said rotor to said crankshaft including:

a generator drive shaft rotatably driven by said crankshaft;

an elastic coupling including an inner member attached to said rotor shaft and an outer member attached to said generator drive shaft, said inner and outer members each having radially extending fins in spaced, alternating relation with respect to one another, and a plurality of separate elastic members disposed between adjacent fins to be compressed or extended in response to relative rotation between said generator drive shaft and said rotor shaft;

a coupling chamber integrally formed on said engine body side casing concentrically enclosing said elastic coupling; and

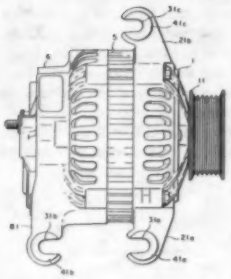
means for sealing said coupling chamber from the interior of said generator.

4,945,272

ALTERNATOR FOR MOTOR VEHICLES

Daisuke Ochi; Yasuhiro Yoshida, and Yoshiyuki Iwaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,385
Claims priority, application Japan, Aug. 6, 1988, 63-104314
Int. Cl.[5] H02K *5/00*
U.S. Cl. 310—91 **5 Claims**



1. An alternator for motor vehicles having a housing formed with a stator (**5**) held between a front bracket (**1**) and a rear bracket (**6**), characterized by:

(a) a first mounting flange (**21***a*) extending downwardly from the front bracket, integral therewith, and defining a first boss (**41***a*) having a first U-shaped groove (**31***a*) for accommodating a mounting bolt to secure the alternator to an engine,

(b) a second mounting flange (**81**) extending downwardly from the rear bracket, integral therewith, and defining a second boss (**41***b*) having a second U-shaped groove (**31***b*) for accommodating an engine mounting bolt, and

(c) a third mounting flange (**21***b*; **2***b*) extending upwardly from the front bracket, integral therewith, and defining a third boss (**41***c*; **4***c*) for accommodating an engine mounting bolt, wherein

(d) said first and second grooves have axes perpendicular to the direction of an axis of rotation of the alternator, and

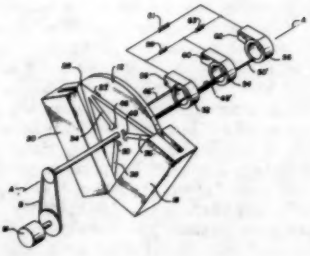
(e) said first and second grooves are oppositely oriented such that openings thereof face each other.

4,945,273

HIGH EFFICIENCY ELECTRICAL MACHINE

Joseph F. Pinkerton, Birmingham, Mich., assignor to Pinkerton Generator Inc., Birmingham, Mich.

Filed Nov. 30, 1989, Ser. No. 443,356
Int. Cl.[5] H02K *3/28*
U.S. Cl. 310—208 **67 Claims**



1. An electrical machine, comprising

a first member including field producing means for producing at least one magnetic field;

a second member having outside conductors, inside conductors, and output electrical connections thereon;

said members being movable relative to each other;

said outside conductors being connected together at spaced connection points to form a continuous outside loop;

said inside conductors having outer ends connected to the spaced connection points on said outside loop, each of said inside conductors having an inner end located within said outside loop;

said output electrical connections being at the inner ends of the inside conductors;

each said outside conductor and the inside conductors connected to its connection points forming an inside loop that occupies only a portion of the circumference of said second member, whereby there is a plurality of said inside loops;

said magnetic field and said inside loops being positioned so that relative movement between said members moves the inside loops sequentially through the magnetic field to induce a current and produce a potential difference between the output electrical connections associated with each inside loop.

4,945,274

ANGULAR PULSE GENERATOR WITH FLUX RETURN

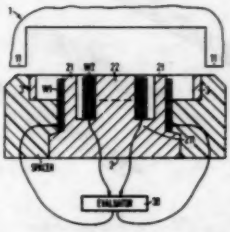
Alfons Pernpeintner, Langguaid, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 17, 1989, Ser. No. 339,215

Claims priority, application Fed. Rep. of Germany, May 16, 1988, 3816642

Int. Cl.[5] G01B 7/30; H02K 19/30; H02P 9/00

U.S. Cl. 310—256 **6 Claims**



1. An angular pulse generator that reads at least one marking on a movable generator part and outputs a pulse when a marking passes by, having a read head with a hollow cylinder that is open at one side, thereby defining an opening, and that is closed at the other side by a floor and with a solid cylinder that is attached on the floor concentrically within the hollow cylinder, and with a primary coil that is wound around the hollow cylinder and a secondary coil that is wound around the solid cylinder, and having an evaluation unit that feeds the primary winding with an alternating voltage having a defined frequency at a primary voltage and that evaluates the phase difference between the primary voltage and a secondary voltage that is induced in the secondary coil and modulated by the generator part and that forms a pulse therefrom, comprising:

a cylindrical stray flux return line outwardly coaxially surrounding at least one part of a half of the primary winding facing toward the opening; and the stray flux return line having predetermined material, dimensions and arrangement such that a major part of a primary flux linked to the primary winding flows via the stray flux return line when the generator part is at a great distance from the read head.

4,945,275

ULTRASONIC DRIVING DEVICE

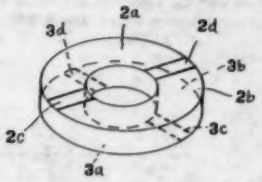
Keisuke Honda, Aichi, Japan, assignor to Honda Electric Co., Ltd., Aichi, Japan

Filed Jul. 20, 1988, Ser. No. 221,718

Claims priority, application Japan, Jul. 26, 1987, 62-187340; Sep. 2, 1987, 62-219791

Int. Cl.[5] H01L 41/08

U.S. Cl. 310—323 **14 Claims**



1. An ultrasonic driving device comprising:

a stator including a ring type piezoelectric vibrator having divided first electrodes on one end thereof and a second electrode on an opposite end thereof,

a member to be driven on one end portion or side portion of the stator, and

AC voltage supply means for supplying an AC voltage to only one first divided electrode and to the second electrode.

4,945,276

TRANSDUCER FOR ARRANGING IN A FLUID, PARTICULARLY FOR THE MEASUREMENT OF THE FLOW-VELOCITY OF A FLUID IN A PIPE, BY TRANSMITTING/RECEIVING SONIC PULSES

Kanagasaba Mylvaganam, Skjoldtun, and Erling Hammer, Mjlkeraen, both of Norway, assignors to Den Norske Stats Oljeselskap A.S., Stavanger, Norway

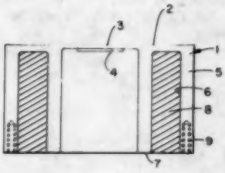
PCT No. PCT/NO88/00029, § 371 Date Feb. 3, 1989, § 102(e) Date Feb. 3, 1989, PCT Pub. No. WO88/08539, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 20, 1988, Ser. No. 312,587

Claims priority, application Norway, Apr. 24, 1987, 871700

Int. Cl.[5] H01L 41/08

U.S. Cl. 310—326 **6 Claims**



1. A transducer for measurement of flow velocity of a fluid by transmitting and receiving sonic pulses, comprising:

a one-piece cup-shaped housing, said housing having a base portion at a closed end thereof and a cylindrical cup-wall portion, thereby forming a hollow central cylindrical chamber;

a membrane forming a central portion of said base portion, said membrane terminating adjacent said cylindrical cup-wall portion;

an electrode centrally disposed on an inner side of said membrane so that a first side of said electrode is connected to said membrane, while a second side of said electrode communicates with said central cylindrical chamber;

means for defining an annular chamber within said cylindrical cup-wall portion; and

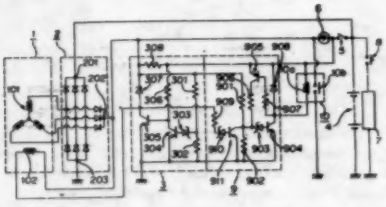
means, filling said annular chamber, for damping vibration in the cup-shaped housing.

4,945,277

CONTROL DEVICE FOR A VEHICLE A.C. GENERATOR

Shiro Iwatani, and Yutaka Kitamura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,054
Claims priority, application Japan, Jan. 9, 1989, 1-912[U]
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—455 4 Claims



1. A control device for a vehicle a.c. generator comprising:

a rectifier connected to an armature coil of the a.c. generator, and having a main rectification output terminal for outputting the rectified output to a battery, and an auxiliary rectification terminal connected to one end of the field coil of the generator;

a voltage regulator which turns on and off the field current by means of a switching element connected to the other end of the field coil to adjust the output voltage from the generator at a predetermined value;

an overvoltage limiting unit including a switching element which conducts when the output voltage from the generator exceeds a predetermined overvoltage level; and

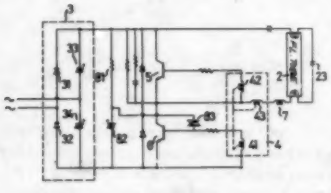
a switching unit which is energized by the conduction of the switching element in the overvoltage limiting unit to ground the auxiliary rectification terminal of the rectifier.

4,945,278

FLUORESCENT TUBE POWER SUPPLY

Tian P. Chern, Tainan, Taiwan, assignor to Loong-Tun Chang, Taiwan

Filed Sep. 9, 1988, Ser. No. 242,475
Int. Cl.[5] H05B 41/24, 41/29
U.S. Cl. 315—209 R 3 Claims



1. A fluorescent tube power supply comprising:

a rectifier doubler circuit including a first and a second rectifier as well as a first and a second filtering electrolytic capacitor to form a full-wave filtering rectifier doubler circuit capable of converting an input of alternating current into direct current and also doubling the voltage to become higher for later use;

an induction windings network comprising a first inductor, a second inductor and a third inductor; the first and second inductors connect to respective bases of a first and a second transistor to provide triggering signals; the first and the second transistors having conductive paths linked at a connecting point and bridging a positive line and a negative line, and the connecting point between the first and the second transistors functions as a terminal, which series connects to a fluorescent tube through the third inductor of the induction windings network;

a resistor and an electrolytic capacitor to act as a delay circuit in series connected to a DiAC to further connect to the base of the second transistor; a resonance capacitor is connected across the filaments of the fluorescent tube and connects to the third inductor to form an LC resonance network having a resonant frequency such that the power supply activates the fluorescent tube at the resonant frequency; and

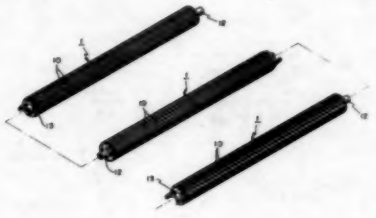
a filtering inductor series connects to the fluorescent tube to filter out extraneous signals, wherein the first, second and third inductors are inductively coupled for inducing an electromotive force in the first and second inductors opposite to a current in the third inductor to alternately disable the second transistor and provide a triggering signal to the first transistor, and disable the first transistor and provide a triggering signal to the second transistor.

4,945,279

LAMP APPARATUS FOR GENERATING SEQUENTIAL FLASHES

Wen-Fong Leu, 17, 4th Fl., Lane 247, Min-Chuan I Rd., Kaohsiung, Taiwan

Filed Dec. 1, 1988, Ser. No. 278,478
Int. Cl.[5] H05B 37/00
U.S. Cl. 315—201 9 Claims



1. A lamp apparatus for generating sequential flashes, comprising:

at least one lamp unit having a socket formed on a first end and a plug formed on a second end thereof, enabling connection between adjacent lamp units and a plurality of xenon tubes to be installed therein;

an ignition circuit device being provided in said lamp unit for starting the flashes of said plurality of xenon tubes within the lamp unit; and

a main driving circuit device for controlling the flash sequence of the xenon tubes in the lamp apparatus.

4,945,280

INDEPENDENT EMERGENCY LIGHTING SYSTEM WITH SELF-DIAGNOSIS

Gian P. Beghelli, Monteveglio, Italy, assignor to G.P.B. Beghelli s.r.l., Bologna, Italy

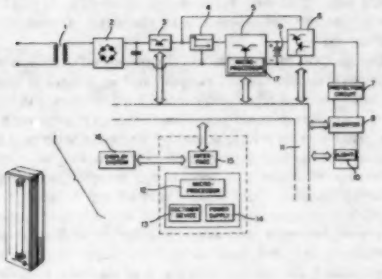
Filed Oct. 14, 1988, Ser. No. 257,863
Claims priority, application Italy, Oct. 29, 1987, 3675 A/87
Int. Cl.[5] H02J 9/00
U.S. Cl. 315—129 5 Claims

1. An independent emergency lighting system with self-diagnosis having individual lighting devices, comprising:

means for controlling timed sequences and sequences affecting the control functions;

means for programming tests and diagnosis of the lighting system, via appropriate interfaces;

means for communicating results of periodical fault tests and independence tests to a centralized control and monitoring unit which is able to issue commands to activate/deactivate lighting equipment;



means for supplying the individual lighting devices by a centralised battery unit equipped with a programmable recharging circuit, a circuit for determining the charging condition and detection of the occurrence of incipient fault conditions; and

means for connecting said controlling means, programming means, communicating means and supplying means together.

4,945,281

FLAT LIGHT SOURCE

Stanley S. Ipson, Bradford, United Kingdom, assignor to Sidefact Limited, Bradford, England

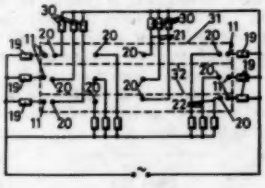
PCT No. PCT/GB87/00017, § 371 Date Sep. 16, 1988, § 102(e) Date Sep. 16, 1988, PCT Pub. No. WO87/04562, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 15, 1987, Ser. No. 220,110

Claims priority, application United Kingdom, Jan. 17, 1986, 8601185; Aug. 19, 1986, 8620172

Int. Cl.[5] H05B *41/00*; H01J *17/34*

U.S. Cl. 315—58 **22 Claims**



1. A flat light source comprising two sheets of material at least one of which is transparent, the sheets being overlaid one upon the other and sealed together to form a gas tight enclosure which is filled with low pressure gas and within which at least one gas discharge can be initiated between a pair of primary electrodes along a predetermined elongate path, the gas discharge path or paths occupying a plurality of adjacent elongate volumes within the enclosure, characterised in that further electrodes are spaced apart along the length of the or each discharge path, each further electrode being connected to a respective capacitive, resistive or inductive impedance.

4,945,282

IMAGE DISPLAY PANEL HAVING ANTISTATIC FILM WITH TRANSPARENT AND ELECTROCONDUCTIVE PROPERTIES AND PROCESS FOR PROCESSING SAME

Hiromitsu Kawamura, Mobara; Takao Kawamura, Chiba; Katsumi Kobara, Mobara, and Yoshishige Endo, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1988, Ser. No. 281,213

Claims priority, application Japan, Dec. 10, 1987, 62-310823; Dec. 10, 1987, 62-310824; Jan. 14, 1988, 63-4715; Feb. 19, 1988, 63-35212

Int. Cl.[5] H01J *9/24, 29/88*

U.S. Cl. 313—479 **36 Claims**

1. An image display panel having an antistatic film comprising a SiO_2 coat of transparent and electroconductive properties on the front surface of said panel; said coat containing fine particles of at least one compound selected from electroconductive metal oxides and hygroscopic metal salts capable of absorbing moisture to impart electroconductivity to said coat.

4,945,283

CATHODE RAY TUBE HAVING A TUBULAR FOCUS STRUCTURE

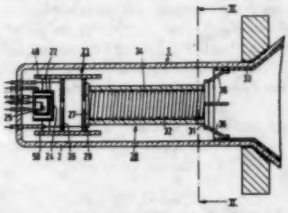
Antonius W. F. Van Der Heijden; Gerardus J. Hellings; Erich E. Himmelbauer; Tjerk G. Spanjer, and Gerardus A. H. M. Vrijssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1989, Ser. No. 301,001

Claims priority, application Netherlands, Jan. 27, 1988, 8800194

Int. Cl.[5] H01J *29/02, 29/62*

U.S. Cl. 313—450 **12 Claims**



1. A cathode ray comprising an envelope containing a luminescent screen and an electron gun for producing an electron beam which is directed to the screen, characterized in that the electron gun comprises:

a. an electron-beam-forming structure including a cathode for emitting electrons and an electrode having a plate-shaped part with an aperture through which the electron beam leaves said structure; and

b. an electron-beam-focusing structure including;

(1) a tubular means of an electrical insulating material having an inner surface and an outer surface;

(2) a layer of resistive material disposed on at least one of said surfaces; and

(3) a first end part of the tubular means having an aperture

for receiving the electron beam and a surface facing the plate-shaped part;

said surface of the first end part being affixed to said plate-shaped part to effect accurate positioning of the electron-beam-focusing structure with respect to the electron-beam-forming structure.

4,945,284

ELECTRON GUN FOR COLOR-PICTURE TUBE DEVICE

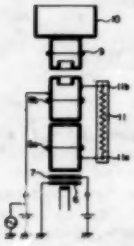
Taketoshi Shimoma, Isesaki; Shinpei Koshigoe, Fukaya, and Takahiro Hasegawa, Gyouda, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 8, 1989, Ser. No. 320,740

Claims priority, application Japan, Mar. 11, 1988, 63-57581

Int. Cl.[5] H01J *29/58*

U.S. Cl. 313—414 **4 Claims**



1. An electron gun for color-picture tube device comprising cathodes for generating electron beams, and a focusing electrode and a final accelerating electrode composing an electron lens for focusing said electron beam, said electrodes being disposed in the axial direction of said tube, whereby said focusing electrode is divided into plural electrode units in the axial direction of the tube, a first focusing electrode unit adjacent to said final accelerating electrode is connected to a second focusing electrode unit adjacent to said first focusing electrode unit through a resistor means, a focusing voltage being changed in synchronous with the deflection of said electron beam is applied to said first focusing electrode unit, the resistor means removes the substantial a.c. components from the focusing voltage, the resulting focusing voltage is applied to said second focusing electrode unit, first electron beam path holes whose major axes extend horizontally are formed on said first focusing electrode side opposite to said second focusing electrode unit, and second electron beam path holes whose major axes extend in the direction orthogonal to said first electron beam path holes are formed on said second focusing electrode unit side opposite to said first focusing electrode unit.

4,945,285

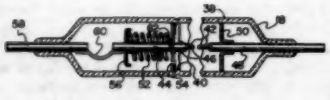
LAMP FOR SCANNING APPARATUS

Jon F. Gehret, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 289,875

Int. Cl.[5] H01J *1/94, 19/50*

U.S. Cl. 313—278 **3 Claims**



1. An elongate lamp for a scanning apparatus comprising an elongate tube having an internal bore and abutment means within said bore adjacent one end of said tube;

an elongate filament housed within said tube, said filament being provided at opposite ends thereof with respective first and second support rods generally coaxial with said filament, said support rods being of greater cross-section than said filament and of relatively low resistance compared to said filament;

first support means adjacent one end of said tube for supporting said first support rod in generally coaxial relation to said tube, said first support rod extending beyond and being hermetically sealed into the adjacent end of said tube; and

second support means adjacent the other end of said tube for supporting said second support rod in generally coaxial relation to said tube, said second support means comprising a support member positioned by engagement with said internal bore of said tube and by abutment with said abutment means, said support member including an opening slidably receiving said second rod member, a spring engaging member fixed to said second rod adjacent to the end thereof opposite said filament, and a coil spring compressed between said support member and said spring retaining member and located between said abutment means and the corresponding end of said tube to maintain said filament under tension.

4,945,286

MICROCHANNEL PLATES FORMED WITH DEPOSITION USING NON-REACTIVE GAS

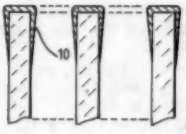
John L. Phillips, South Croydon, and Robert P. Ball, London, both of Great Britain, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,711

Claims priority, application United Kingdom, Dec. 9, 1987, 8728760

Int. Cl.[5] H01J *9/12, 1/32, 43/10*

U.S. Cl. 313—105 CM **22 Claims**



18. A microchannel plate having an output electrode which extends into the output end of each channel, the output electrode comprising a conductive layer characterized in that the thickness of the conductive layer within the output end of each channel is a continuously tapering function of the distance into the channel such that the thickness decreases with increasing penetration into the channel, said conductive layer forming exterior surfaces of said output end of each channel and exterior surfaces within each channel.

4,945,287

MULTIPLE PENTAPRISM SCANNING DEVICE AND METHOD

John A. Lawson, Centerville, Ohio, assignor to Eotron Corporation, Dayton, Ohio

Filed Jun. 13, 1988, Ser. No. 205,993

Int. Cl.[5] H01U *3/14*

U.S. Cl. 250—236 **24 Claims**

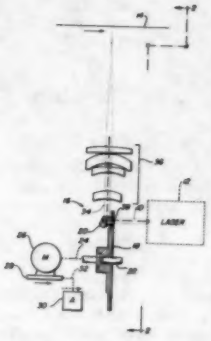
1. A scanning device for causing a beam of light to be repetitively swept across a surface, comprising:

means for providing a beam of light,

pentaprism assembly means for redirecting said beam of light to said surface, said pentaprism assembly means

including a support member and a plurality of pentaprism elements positioned around the periphery of said support member,

means for rotating said support member such that successive



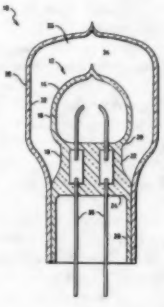
ones of said plurality of pentaprism elements are brought into the path of said beam of light and redirect said beam of light to said surface, whereby movement of each pentaprism element while intersecting said beam of light causes said beam of light to sweep across said surface.

4,945,288

DOUBLE JACKET LAMP

Merle E. Morris, Lexington; Michael L. Martin, Jeffersonville; Louis D. Neff, Mt. Sterling, and George B. Kendrick, Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 21, 1988, Ser. No. 287,932
Int. Cl.[5] H01J *61/34*
U.S. Cl. 313—25 **26 Claims**



1. A double jacket arc lamp comprising:

(a) an electric lamp capsule having an inner light transmissive envelope with electrical leads extending from the inner envelope through a first press seal having an inner side adjacent the enclosed volume, a central portion where the seal is made, and an outer side adjacent the exterior, and

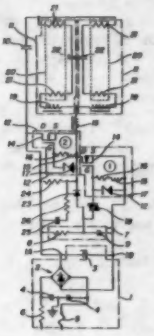
(b) a tubular, second light transmissive envelope sealed to the inner envelope at a second seal to substantially surround the electric lamp capsule and form an enclosed volume between a portion of the exterior of the inner envelope and the interior of the outer envelope with the leads extending to the exterior of the outer envelope.

4,945,289

ELECTRONIC SUPPLY SYSTEM FOR FLUORESCENT TUBES WITH ELECTRODES

Jean-Claude Harel, Tarascon, France, assignor to Interpatents Ltd., London, England

PCT No. PCT/CH87/00085, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07469, PCT Pub. Date Dec. 3, 1987
PCT Filed May 20, 1987, Ser. No. 162,407
Claims priority, application France, May 23, 1986, 86 07508
Int. Cl.[5] H05B *41/29*
U.S. Cl. 315—226 **5 Claims**



1. An electronic supply system for fluorescent tubes with electrodes, said system connectable across an AC source, said system comprising:

(a) a supply means for providing DC voltage, said supply means having input terminals adapted to be connected across said AC source and first and second output terminals across which said supply means provides a DC voltage;

(b) an element having a time constant, said element connected across said first and second output terminals, said element comprising a resistor connected in series with a capacitor, said resistor and said capacitor having a common electrical point therebetween;

(c) two MOS power transistors connected in series between said first and second output terminals, said two MOS power transistors having a common electrical point therebetween;

(d) at least one lighting unit connected in circuit between said common electrical point between said two power transistors and said first output terminal;

(e) a transformer having a primary winding and first and second secondary windings, the primary winding of said transformer connected in circuit between said at least one lighting unit and said common electrical point between said two power transistors;

(f) means for controlling one of said two MOS power transistors, said means including the first secondary winding of said transformer;

(g) means for controlling the other of said two MOS power transistors, said means including the second secondary winding of said transistor said means connected in circuit to said output terminal;

(h) a bilateral conducting element having a breakdown effect connected in circuit between said common point between the resistor and capacitor of the element having a time constant and said means for controlling the other of said two MOS power transistors, said bilateral conducting element having a breakdown effect being operable to provide a pulse;

(i) a capacitor connected in circuit between said at least one lighting unit and said output terminal, said capacitor only

beginning to be charged when one of said two MOS power transistors is saturated as a result of the pulse provided by the bilateral conducting element having a breakdown effect; and

(j) said means for controlling one of said two MOS power transistors comprises the first secondary winding of said transformer, a first resistor connected in series with the first secondary winding, and a first zener diode connected in parallel with the series connection of said first secondary winding of said transformer and said first resistor and; further, wherein said means for controlling the other of said two MOS power transistors comprises the second secondary winding of said transistor, a second resistor connected in series with the second secondary winding, and a second zener diode connected in parallel with the series connection of said second secondary winding of said transformer and said second resistor.

4,945,290

HIGH-POWER RADIATOR

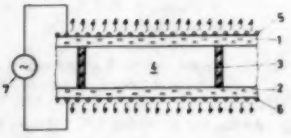
Baldur Eliasson, Birmenstorf, and Ulrich Kogelschatz, Hausen, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Oct. 21, 1988, Ser. No. 260,869

Claims priority, application Switzerland, Oct. 23, 1987, 4156187

Int. Cl.[5] H01J *61/06*

U.S. Cl. 315—246 **13 Claims**



1. A high-power radiator for ultraviolet light, said high-power radiator comprising:

(a) a first dielectric having a first side and a second side;

(b) a second dielectric having a first side facing but spaced from the first side of said first dielectric to form a discharge space therebetween and a second side;

(c) a first electrode located on the second surface of said first dielectric;

(d) a second electrode located on the second surface of said second dielectric;

(e) a filling gas located in said discharge space; and

(f) a source of alternating current connected to said first and second electrodes,

(g) wherein said first dielectric, said second dielectric, said first electrode, and said second electrode are all transparent to radiation from said filling gas.

4,945,291

LAMP-LIGHTING DEVICE

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Apr. 12, 1988, Ser. No. 182,865

Claims priority, application Japan, Apr. 18, 1987, 62-95933

Int. Cl.[5] H05B *39/04*

U.S. Cl. 315—307 **7 Claims**

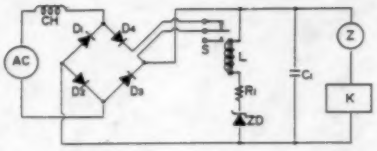
1. A device for lighting an incandescent lamp, consisting of:

a full-wave rectifier having both an input terminal connected with an ac source and an output terminal connected with an incandescent lamp;

a smoothing means connected in parallel with the incandescent lamp;

a detecting means to monitor a voltage across the incandescent lamp; and

means to switch the operation of said rectifier to half-wave rectification mode, said switching means switching the operation of said rectifier to half-wave rectification mode in order to decrease a voltage across the incandescent lamp to a prescribed level when a voltage across the



incandescent lamp exceeds the prescribed level and is detected by said detecting means; and

means to connect said switching means with said detecting means.

4,945,292

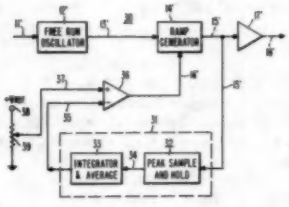
DYNAMIC VERTICAL HEIGHT CONTROL CIRCUIT

Bruce D. Ackerson, Holladay; Stephen J. Paker, Bountiful, and Clayton C. Wahlquist, West Valley City, all of Utah, assignors to Unisys Corp., Blue Bell, Pa.

Filed Aug. 8, 1988, Ser. No. 229,539

Int. Cl.[5] H01J *29/70*

U.S. Cl. 315—387 **9 Claims**



1. A dynamic vertical height control circuit comprising:

variable frequency oscillator means for receiving a dynamic variable frequency input,

ramp generator means coupled to the output of said oscillator means for generating a constant amplitude deflection ramp signal,

feedback means coupled to the output of said ramp generator means for generating a constant level gain control signal which is applied to the gain control of the ramp generator for maintaining a constant amplitude ramp signal from said ramp generator over a range of frequencies,

said feedback means comprising a comparator in a feedback loop having a voltage reference input and an analog voltage input indicative of the average analog voltage generated from the output of said ramp generator.

4,945,293

WEB TENSION CONTROL SYSTEM

Eugene W. Wittkopf, Little Suamico, and Glen B. Leanna, Green Bay, both of Wis., assignors to Integrated Design Corp., Green Bay, Wis.

Filed Sep. 18, 1989, Ser. No. 408,779

Int. Cl.[5] B65H *59/38*

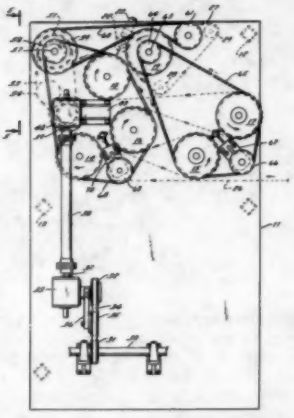
U.S. Cl. 318—7 **18 Claims**

1. A method of controlling the draw or tension in a web processing machine which is driven by a motor driven main drive shaft, the web being drawn in said machine by a driven roll means and wherein a strain wave gear device having coacting elements including a flexspline, power output shaft, circular spline, and wave generator, is interposed between said

main drive shaft and driven roll means to drive said driven roll means rotationally to transport the web, and further the power output shaft of the flexspline of the strain wave gear device is coupled in driving relation to said driven roll means, the spline of said strain wave gear device and a servomotor is coupled to the wave generator of said strain wave gear device to drive the wave generator rotationally, the method including the steps of:

driving said circular spline rotationally at a speed proportional to said main drive shaft,

operating said servomotor to drive said wave generator rotationally at a substantially higher speed continuously in one and the same rotational direction in which said circular spline is driven such that when the wave generator is rotating at a predetermined speed there is zero draw in said driven web leading to said driven roll means,



repeatedly determining the ratio of the wave generator speed relative to the main drive shaft speed as an indication of the percent of draw,

comparing the determined ratio with a preset stored value representing the percent of draw desired in the web, and

if said determined ratio is greater than said stored value to indicate that the flexspline power output shaft is rotating at a speed and is driving said driven roll means at a speed which is resulting in the percent of draw exceeding said preset value, then causing said servomotor to increase the rotational speed of said wave generator to reduce the speed of said power output shaft until said determined ratio and said preset value match, and

if said determined ratio is less than said preset value, then causing said servomotor to decrease the speed of the wave generator to increase the speed of said output shaft until said determined ratio and preset value match.

4,945,294

ELECTRONIC DAMPING CIRCUIT

Edward Anderson, Jr., San Francisco, Calif., assignor to Array Technologies, Inc., Oakland, Calif.

Filed Oct. 26, 1988, Ser. No. 263,035

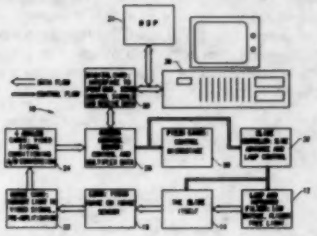
Int. Cl.[5] H02P *5/20*

U.S. Cl. 318—119 **5 Claims**

1. An electronic circuit for moving and stopping an object, responsive to a drive signal, from a first position to a final position, without physical damping or substantial ringing and the like, said circuit comprising:

means for generating a first signal for moving said object monotonically and continuously from said first position to an intermediate position, approximately one-half the distance between said first position and said final position, said object having a resonant frequency in response to said first signal; and

means for generating a second signal wherein said second signal is a time delay of said first signal by greater than or equal to one-half the rate of said resonant frequency, for moving said object monotonically and continuously from said intermediate position to said final position



wherein said first signal and said second signals are the components of said drive signal.

4,945,295

OPERATION CONFIRMATORY CIRCUIT FOR LINEAR ACTUATOR

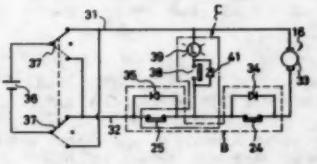
Fumihiko Hara, Ohtsu; Shuji Hayashi, Mishima, and Genjiro Yamada, Sakai, all of Japan, assignors to Tsubakimoto Chain Company and Kabushiki Kaisha Nikken, both of, Japan

Filed Oct. 4, 1988, Ser. No. 253,198

Claims priority, application Japan, Dec. 2, 1987, 62-303203

Int. Cl.[5] B60Q *11/00*

U.S. Cl. 318—490 **6 Claims**



1. An operation confirmatory circuit for a linear actuator having an operating rod operable between opposite first and second end positions by a reversible electric motor comprising:

a first switch normally closed when said operating rod is located near the first end position;

a second switch normally closed when said operating rod is located at the second end position;

a confirmation lamp connected in a series with said first and second switches; and

a diode connected in parallel with said first switch and adapted to permit electric current to flow therethrough when the rod moves in the opposite direction from said first end position as a result of reverse rotation of said motor.

4,945,296

VARIABLE SPEED CONTROLLABLE INDUCTION MOTOR

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering

Filed Jul. 12, 1988, Ser. No. 217,966

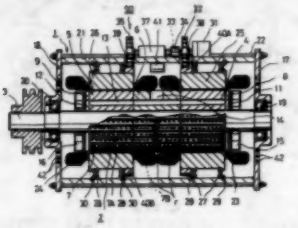
Claims priority, application Japan, Jul. 14, 1987, 62-176475; Sep. 7, 1987, 62-225082

Int. Cl.[5] H02K *27/20*

U.S. Cl. 318—538 **11 Claims**

1. A variable speed controllable induction motor comprising:

a single rotor formed in one-piece having a plurality of rotor cores axially mounted on a common axis with a non-magnetic portion being provided between said rotor cores and having, on said rotor cores, a plurality of sets of rotor conductive members including first group conductive members effective specifically for a low speed range and a second group conductive members effective specifically for a high speed range, at least said first group conductive members being short-circuited at said non-magnetic portion by resisting members and each set of said rotor conductive members being respectively connected linearly;



a plurality of stators disposed side by side and surrounding and facing said respective rotor cores; and

phase shifting means for producing phase differences between the voltage induced on the portions of said rotor conductive members which face one of said plurality of stators and the voltage induced on the corresponding portions of said rotor conductive members which face the another one of said stators;

whereby a rotation speed of said rotor can be varied by the controlling of said phase shifting means.

4,945,297

ELECTRONIC DEVICE FORMING A BIDIRECTIONAL INTERFACE FOR CONTROLLING A LOAD SWITCHING POWER ELEMENT

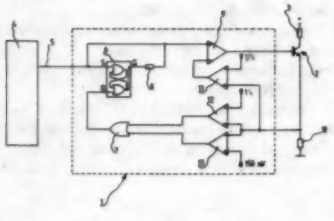
Andreé Coustre, Andresy, France, assignor to Automobiles Peugeot and Automobiles Citroen, both of, France

Filed May 18, 1988, Ser. No. 195,697

Claims priority, application France, May 19, 1987, 87 06993

Int. Cl.[5] G05B *23/02*

U.S. Cl. 318—558 **9 Claims**



1. A bidirectional interface-forming electronic device for controlling a power element for switching a load from a central control unit, comprising

one logical circuit connected to an input/output of the central control unit through a unique wire connection and a ground connection to control the power element for switching or disabling the load and to inform the central control unit of the condition of the load through the wire connection wherein said logical circuit is a bistable circuit, one control input of which is connected to the wire connection and which memorized at its output signal for controlling the conductive condition of the power element, which comes from the central control unit in an output mode, the output signal of the bistable circuit being applied back to the control input of the bistable circuit to inform the central control unit in an input mode of the normal operation of the load.

4,945,298

MOTOR DRIVING APPARATUS

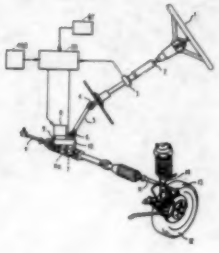
Hiroshi Nakashima, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 6, 1989, Ser. No. 306,729

Claims priority, application Japan, Feb. 5, 1988, 63-25257

Int. Cl.[5] G05B *11/01*

U.S. Cl. 318—635 **5 Claims**



1. A motor driving apparatus including a motor controllable to be switched on and off during each cycle of operation, a Pulsed Width Modulation circuit for controlling the on and off times of said motor during each cycle of operation, and a current supplying means for supplying current to said motor, the apparatus comprising:

current detecting means for detecting the current flowing through said motor; and

current prohibiting means for prohibiting current from being supplied to said motor when said current detecting means detects that the current flowing through said motor exceeds a predetermined level, said current prohibiting means continuing to prohibit current from being supplied to said motor after said current detecting means detects that the current flowing through said motor exceeds the predetermined level until the next operation cycle of said motor so that said motor is connected to receive current only once per operation cycle.

4,945,299

CONTROL APPARATUS FOR AN A.C. GENERATOR FOR AUTOMOBILE

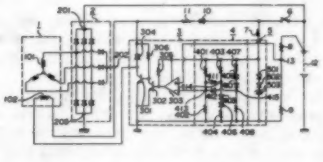
Hirofumi Watanabe, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,770

Claims priority, application Japan, Jul. 7, 1988, 63-169623

Int. Cl.[5] H02J *7/14*

U.S. Cl. 322—33 **2 Claims**



1. A voltage control apparatus for an a.c. generator for an automobile, which comprises:

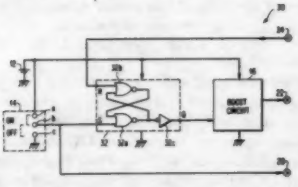
an a.c. generator having an armature winding (101) and a field winding (102),
a rectifier (2) for rectifying the output of the a.c. generator to charge a battery (12) containing an electrolyte,
a voltage detection circuit (8,9) for detecting the voltage of the battery,
a constant voltage circuit (5) for generating a constant voltage on the basis of the voltage of the battery through the operation of a key switch (6),
a reference voltage circuit (4) comprising:
(i) a first voltage divider including two resistors (401,402) connected in series and defining a first junction point (413) therebetween,
(ii) a second voltage divider including a resistor (403) and a diode (405,406) connected in series and defining a second junction point (414) therebetween,
(iii) a third voltage divider including a diode (409,410) and a resistor (408) connected in series and defining a third junction point (415) therebetween,
(iv) the second junction point having a negative voltage-temperature characteristic with respect to the electrolyte temperature, the third junction point having qa positive voltage-temperature characteristic with respect to the electrolyte temperature, and the first, second and third voltage dividers being connected between said constant voltage circuit and ground,
(v) a first coupling diode (411) connected to the second junction point for supplying a potential thereof to the first junction point, and
(vi) a second coupling diode (412) connected to the third junction point for supplying a potential thereof to the first junction point and having a polarity opposite that of the first coupling diode, and
a voltage control circuit (3) for comparing the voltage of the voltage detection circuit with the voltage of the first junction point of the reference voltage circuit and controlling a field current to the field winding depending on a difference in the comparison to render the voltage of the battery constant, wherein:
(a) the voltage at the first junction point remains constant below a first predetermined electrolyte temperature (t1).
(b) the voltage at the first junction point decreases with an electrolyte temperature increase at a first reduction rate between said first temperature and a second, higher predetermined electrolyte temperature (t2), and
(c) the voltage at the first junction point decreases with an electrolyte temperature increase at a second lower reduction rate above said second temperature.

4,945,300

POWER SOURCE CONTROL APPARATUS

Toshifumi Sato, and Motoki Ide, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,213
Claims priority, application Japan, Jan. 29, 1988, 63-19210
Int. Cl.[5] G05B *24/02*
U.S. Cl. 323—318 **6 Claims**



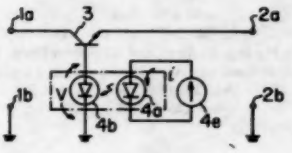
1. A power source control apparatus for controlling a power source which comprises a battery and feeding an operating voltage to external electronic equipment, comprising:
power switch means connected in parallel to said battery for generating a power ON/OFF signal when said power switch means is turned on and off;
reset/set flip-flop means, wherein a set input to said reset/set flip-flop means is the power ON/OFF signal while a reset input to said reset/set flip-flop means is a power control signal which said external electronic equipment generates in response to the power ON/OFF signal, an output of said reset/set flip-flop means turned to a set state when said power switch is turned on and to a reset state when the power control signal is entered; and
boosting means connected in parallel to said battery for boosting an output voltage of said battery to produce the operating voltage and in response to the output of said reset/set flip-flop means to deliver the output voltage as a source voltage.

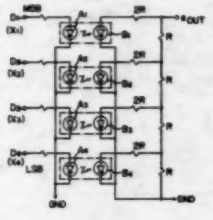
4,945,301

CONSTANT-VOLTAGE POWER SUPPLY CIRCUIT AND AMPLIFIER CIRCUIT AND DA CONVERTER USING THE CONSTANT-VOLTAGE POWER SUPPLY CIRCUIT

Yoshiro Koga; Hiroshi Kume, and Kenji Nakao, all of Neyagawa, Japan, assignors to Onkyo Kabushiki Kaisha, Japan

Filed Jan. 10, 1988, Ser. No. 205,459
Claims priority, application Japan, Jan. 12, 1987, 62-090961[U]; Sep. 7, 1987, 62-137293[U]; Sep. 7, 1987, 62-224755
Int. Cl.[5] G05F *1/44*
U.S. Cl. 323—902 **17 Claims**





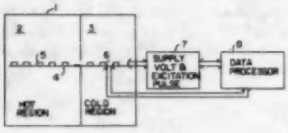
1. A constant-voltage power supply circuit having a reference voltage circuit comprising:
a light emitting element and a photosensitive element optically coupled with each other; and
a driving power source for driving said light emitting element such that said light emitting element emits an amount of light sufficient to cause an output voltage of said photosensitive element to reach a saturation point thereof to become a non-variable constant voltage;
wherein said non-variable constant output voltage of said photosensitive element is used as a reference voltage.

4,945,302

PROCESS AND A CIRCUIT BOARD FOR PERFORMING TESTS DURING BURN-IN OF INTEGRATED SEMI-CONDUCTOR CIRCUITS

Viggo K. Jansen, Allerod, Denmark, assignor to Scantest Systems A/S, Varlose, Denmark

Filed Apr. 21, 1988, Ser. No. 184,505
Claims priority, application Denmark, Apr. 24, 1987, 2080/87
Int. Cl.[5] G01R 31/10
U.S. Cl. 324—73.1 14 Claims



1. A process for dynamic testing and burn-in of a plurality of integrated circuits of a circuit board, comprising the steps of:

heating each circuit board to an elevated temperature for a predetermined time period corresponding to a pre-determined operating life of the integrated circuits;

cooling each circuit board to an operating temperature substantially lowr than the elevated temperature;

testing functionally at the operating temperature each individual integrated circuit of the circuit board independently of other integrated circuits of the board; and

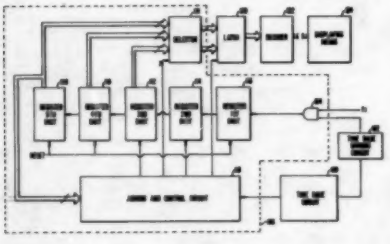
repeating the heating step subsequent to each testing step until the error rate of the individual integrated circuits reaches a pre-determined level during a testing step.

4,945,303

FREQUENCY DETECTOR

Chiang-Tung Hwang, Keelung, and Ray-Shun Chou, Taipei, both of Taiwan, assignors to Acer Incorporated, Taipei, Taiwan

Filed Feb. 27, 1989, Ser. No. 316,360
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—78 D 8 Claims



1. Frequency detecting apparatus comprising:

(a) means for providing a time base;

(b) means for dividing said time base into a plurality of discrete time bases;

(c) means for counting a number of clock pulses during said discrete time bases;

(d) means for indicating a frequency of said clock pulses based on said number of clock pulses; and

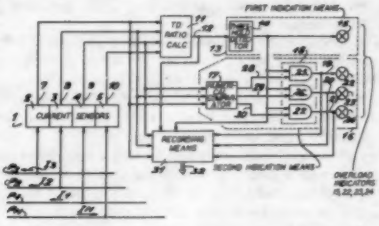
(e) round off means assigning a value of 5 to a most significant digit of said frequency which is not to be displayed and a value of 0 to all other digits.

4,945,304

DEVICE FOR MONITORING THE UNBALANCE OF THE ELECTRIC POWER DEMANDED

Paul Feron, Toulouse, France, assignor to Service National Electricite de France, France

Filed Aug. 9, 1989, Ser. No. 391,177
Claims priority, application France, Aug. 9, 1988, 88 10739
Int. Cl.[5] G01R 25/00
U.S. Cl. 324—107 5 Claims



1. A device to monitor the unbalance of the electric power demanded on the conductive lines of a network or three-phase alternating electrical installation, said network including one line for each phase and a return current neutral line, wherein said device comprises a means to measure the currents connected to the lines of the network so as to supply on respective outputs the numerical values of the currents circulating in these lines, a means to calculate the value of the ratio, at a given instant of the value of the current circulating in the neutral line, to the sum of the values of the currents circulating in the phase lines, a numerical signal representative of the value of the ratio being supplied on one output of the calculation means, a first indication means connected to the output of the calculation means so as to indicate when the value of said ratio exceeds a predetermined unbalance threshold, while the power demanded at the same moment itself is greater than a certain proportion of the power assigned, and a second indication means connected to the outputs of the means for measuring the currents in the phase lines and to one output of the first indication means so as to localize the phase line in which a current is circulating whose value is greater than each of the values of the currents circulating in the other phase lines, the localized line being the one which has caused the unbalance.

4,945,305

DEVICE FOR QUANTITATIVELY MEASURING THE RELATIVE POSITION AND ORIENTATION OF TWO BODIES IN THE PRESENCE OF METALS UTILIZING DIRECT CURRENT MAGNETIC FIELDS

Ernest B. Blood, Burlington, Vt., assignor to Ascension Technology Corporation, Vt.

Continuation-in-part of Ser. No. 917,389, Oct. 9, 1986, Pat. No. 4,849,692. This application Apr. 11, 1989, Ser. No. 336,342
The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.
Int. Cl.[5] G01B 7/14; G01S 5/04
U.S. Cl. 324—207.17 25 Claims

1. A device for quantitatively measuring the position of receiver antennae relative to transmitter antennae comprising:

transmitter antennae consisting of at least two aparallel antennae to generate at least two DC magnetic vectors;

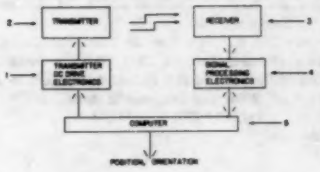
drive means for sequentially supplying said aparallel antennae with DC pulses to generate said DC magnetic vectors;

receiver antennae consisting of at least two aparallel antennae to detect said DC magnetic vectors;

the number of transmitter antennae times the number of receiver antennae being at least equal to the number of degrees of freedom of the desired quantitative measure-

ment of the position of the receiver antennae relative to the transmitter antennae;

means for compensating for the effects of the earth's magnetic field on the operation of the device; and



signal processing means to ascertain the magnitude of the detected DC magnetic vectors and to quantitatively compute said relative position from said received DC magnetic vectors.

4,945,306

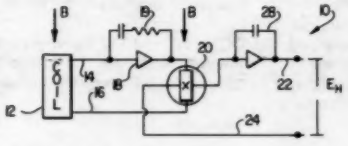
COIL AND HALL DEVICE CIRCUIT FOR SENSING MAGNETIC FIELDS

Frank E. Lowther, Plano, Tex., assignor to Atlantic Richfield

Filed Oct. 25, 1988, Ser. No. 262,372

Int. Cl.[5] G01N *27/83*; G01R *33/06*

U.S. Cl. 324—220 **16 Claims**



4. A device for sensing a relatively minute change in a magnetic field passing through a member formed of a magnetic material, which change is caused by a magnetic anomaly associated with said magnetic material, said device comprising:

a wire coil arranged to be disposed in said magnetic field and in proximity to said member;

means for producing a magnetic field passing through said member and said coil;

a Hall effect element disposed in said magnetic field, said Hall effect element including conductor means connected to said coil for conducting a current to said Hall effect element as a bias current and which is produced by a voltage signal generated in said coil as a result of a change in the intensity of said magnetic field;

signal output conductor means connected to said Hall effect element for producing a voltage across said signal output conductor means; and

an integrating circuit connected to said Hall effect element for integrating the signal output from said Hall effect element to provide a voltage across said output conductor means proportional to said change in the intensity of said magnetic field.

4,945,307

ELECTRONIC DEVICE FOR DETECTING IRREGULARITIES IN A SURFACE OF A SOLID OBJECT

Bengt Törnblom, Västerås, Sweden, assignor to Törnbloms Kvalitetskontroll AB, Västerås, Sweden

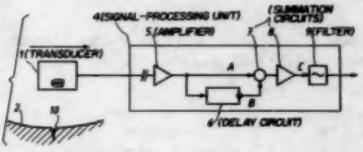
PCT No. PCT/SE83/00409, § 371 Date Jun. 15, 1984, § 102(e) Date Jun. 15, 1984, PCT Pub. No. WO84/02189, PCT Pub. Date Jun. 7, 1984

Continuation of Ser. No. 621,916, Jun. 15, 1984, abandoned. This PCT application Nov. 22, 1983, Ser. No. 926,850

Claims priority, application Sweden, Nov. 24, 1982, 8206678

Int. Cl.[5] G01N *27/90*; G01R *33/12*

U.S. Cl. 324—225 **12 Claims**



1. Apparatus for detecting irregularities in the surface of an object, comprising:

a transducer adapted to be moved over the surface and provide output signals representative of surface irregularities thereof;

said output signal comprising a first low frequency signal resulting from the varying distance between the transducer and the surface and a second signal of higher frequency than said first signal and representative of said surface irregularities;

means for processing said output signal and including parallel first and second channels, said first channel conducting said output signal and said second channel including means for delaying said output signal, said processing means further including means for combining the output signal from said first channel and the delayed output signal from said second channel to essentially remove said low frequency signal and enhance said second signal to produce a measuring output signal representative of said surface irregularities.

4,945,308

VOLUME SELECTED NMR SPECTROSCOPY

David M. Doddrell, Westlake, and William M. Brooks, Mount Gravatt, both of Australia, assignors to University of Queensland, Queensland, Australia

PCT No. PCT/AU87/00113, § 371 Date Oct. 28, 1988, § 102(e) Date Oct. 28, 1988, PCT Pub. No. WO87/06700, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 24, 1987, Ser. No. 283,482

Claims priority, application Australia, Apr. 24, 1986, PH5608

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **7 Claims**

1. A method of volume-selected NMR spectroscopy including the steps of:

(a) applying a first rf pulse of selected bandwidth and duration to a volume element in the sample body in the presence of a field gradient superimposed upon an initial homogenous magnetic field;

(b) applying a hard refocussing pulse to the sample body to refocus a signal phase roll resulting from the first pulse in step (a), a time delay being dependent on the duration of the first pulse;

(c) after the time delay from the termination of the hard

refocussing pulse, pulsing a refocussed coherent signal back to a reference axis with a third pulse, and

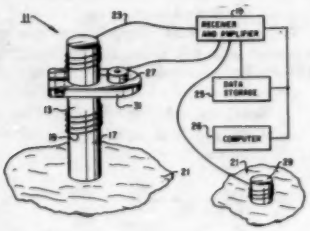
(d) recording the signal from the volume element, in the absence of the field gradient.

4,945,309

METHOD OF REDUCING IMPULSIVE NOISE IN ELECTROMAGNETIC GEOPHYSICAL DATA

Brian R. Spies, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 14, 1989, Ser. No. 393,559
Int. Cl.[5] G01V *3/00*
U.S. Cl. 324—345 **13 Claims**



1. A method of reducing impulsive noise in electromagnetic geophysical data, comprising the steps of:

(a) providing receiving antenna means for receiving an electromagnetic signal, said receiving antenna means receiving impulsive noise;

(b) providing noise sensor means for receiving said impulsive noise and placing said noise sensor means so as to receive the impulsive noise that is received by said receiving antenna means and so as to minimize the reception of said electromagnetic signal;

(c) simultaneously receiving said electromagnetic signal with said receiving antenna means so as to create a signal record and receiving said impulsive noise with said noise sensor means so as to create a noise record;

(d) examining said noise record for occurrences of said impulsive noise by comparing said noise record with a threshold noise value and identifying those instances of time in which said noise record exceeds said threshold;

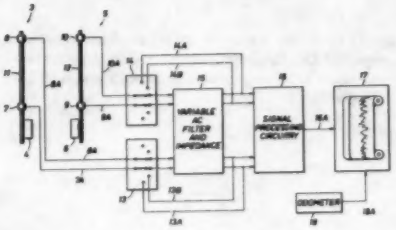
(e) removing those portions of said signal record which are simultaneous with said identified instances in which said noise records exceeds said threshold, wherein said signal record has reduced impulsive noise.

4,945,310

PASSIVE GEOPHYSICAL SURVEY METHOD BASED UPON THE DETECTION OF THE DC COMPONENT OF THE VERTICAL ELECTRICAL POTENTIAL OF NATURAL EARTH CURRENTS

John R. Jackson, 1401 E. Girard, #143, Englewood, Colo. 80110, assignor to J. R. Jackson and A. M. Arismendi, Jr., both of Gaithersburg, Md.

Division of Ser. No. 821,967, Jan. 29, 1986, Pat. No. 4,841,250.
This application Jun. 16, 1989, Ser. No. 367,018
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[5] G01V *3/165, 3/08*
U.S. Cl. 324—349 **6 Claims**



1. A method for performing passive geophysical measurements as a function of natural Earth currents, said method comprising:

(a) sensing an electrical potential occurring between at least one pair of vertically spaced points above the Earth and within the lower atmosphere adjacent thereto as a function of said natural Earth currents;

(b) generating an electrical signal proportional to said electrical potential, said electrical signal having an AC component and a DC component;

(c) filtering out the AC component of said electrical signal leaving the DC component thereof and outputting a DC signal; and

(d) measuring said DC signal, said DC signal providing an indication of the lithological character of adjacent Earth materials as a function of the DC component of said electrical potential.

4,945,311

ELECTRONICALLY VARIABLE EQUALIZER

Robert F. Smith, San Jose, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

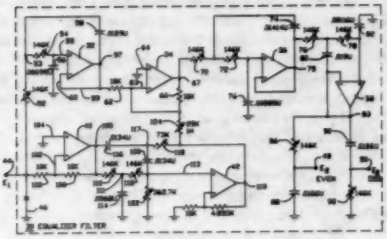
Filed Aug. 29, 1988, Ser. No. 237,876
Int. Cl.[5] H03B *1/00*; H03K *5/00*
U.S. Cl. 328—167 **17 Claims**

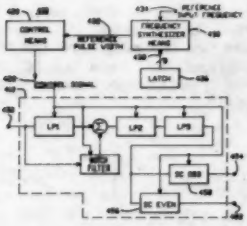
1. An electronically variable equalizer filter, having a variable cutoff frequency, comprising:

two or more active RC filter networks each having variable R values, said one or more active RC networks being coupled together to form said equalizer filter; and

means connected to each of said RC filter networks for simultaneously varying the R values of each of said two or more active RC networks, which means for simultaneously varying maintains a substantially constant ratio between the R values of each active RC filter network

such that the relative shapes of the magnitude and phase characteristics of said equalizer filter remains substantially





constant as the cutoff frequency of said equalizer filter is varied.

4,945,312

METHOD AND DEVICE FOR THE DEMODULATION OF SIGNALS WITH CONSTANT ENVELOPE AND CONTINUOUS PHASE ANGLE MODULATION BY A TRAIN OF BINARY SYMBOLS TOLERATING FREQUENCY DRIFTS

Gérard Auger, Champagne Sur Oise; Pierre A. Laurent, Bessancourt, and Patrick Mocchi, Chatou, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Jul. 17, 1989, Ser. No. 380,537

Claims priority, application France, Jul. 19, 1988, 88 09731

Int. Cl.[5] H03D *3/00*

U.S. Cl. 329—345 **8 Claims**

1. A method for the demodulation of constant envelope and continuous phase signals having a bit period T_b, consisting in the performing of a digital processing operation for successive groups of n_b bits, of a received signal brought into baseband, the phase of which is over-sampled with respect to the bit period T_b, consisting:

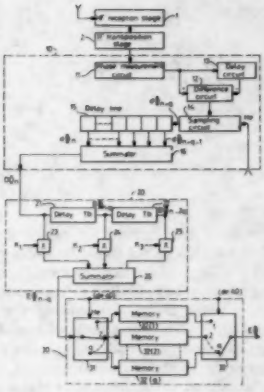
in a first stage, in measuring q subsets of n_b differential phases at the bit period, using starting instants, staggered with respect to one another by fractions T_b/q of this period to form staggered sampling combs at the bit period;

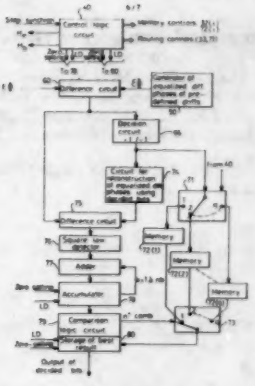
in a second stage, in making d a priori corrections of each of said q subsets of differential phases by phase deviations associated with a set of d pre-defined frequency drifts, to generate d times q subsets of n_b corrected differential phases, and deducing therefrom d times q sets of n_b associated demodulated bits, each corresponding to a measured subset of differential phases associated with one of said d pre-defined drifts;

in a third stage, reconstructing the differential phases supposed to have been emitted from each of the sets of n_b demodulated bits, and in computing, for each of the d times q sets of demodulated bits, a noise criterion taking into account the subset of reconstructed differential phases and the associated subset of corrected differential phases measured and corrected as a function of a predefined drift;

in a fourth stage, selecting the set of n_b bits that minimizes the noise criterion, the predefined frequency drift that is associated with said selected set of n_b bits corresponding to a rough estimation of the real drift;

in a penultimate stage, computing, on the basis of the selected set of demodulated bits, a fine estimation of the real drift by calculating mean of differences between the measured differential phases and the reconstructed differential





phases associated with this set of n_b bits, and then a final phase deviation associated with said fine estimation of the real drift;

and, in a last stage, performing a demodulation of the q subsets of measured differential phases, after having corrected them by the final phase deviation associated with the fine estimate of the real drift, in computing, for each, the noise criterion and in selecting, among the sets of resulting bits, that set which minimizes the noise criterion, the sampling comb associated with it forming the synchronization bit.

4,945,313

SYNCHRONOUS DEMODULATOR HAVING AUTOMATICALLY TUNED BAND-PASS FILTER

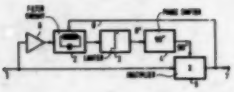
Joachim C. Brilka, and Wolfgang Weltersbach, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,210

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1988, 3819460; Jun. 8, 1988, 3819461

Int. Cl.[5] H03D 1/22; H04N 5/62

U.S. Cl. 329—349 10 Claims



1. A synchronous demodulator for demodulating a carrier signal modulated with a useful signal, said demodulator comprising a filter circuit for selecting the carrier signal, a limiter for generating an amplitude-limited reference signal from the carrier signal, a phase shifter for shifting the phase of the reference signal through a phase angle of essentially 90° with respect to the carrier signal, and a multiplier for multiplicatively combining the modulated carrier signal with the phase shifted reference signal, characterized in that a direct voltage supplied as a mixing product by the multiplier as a measure of the frequency deviation of the carrier signal from the pass frequency of the filter circuit is applied as a variable to this filter circuit for the purpose of controlling the pass frequency.

4,945,314

AMPLIFIER ARRANGEMENT WITH SATURATION DETECTION

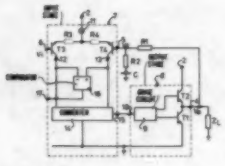
Martinus J. Van Den Bungelaar, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

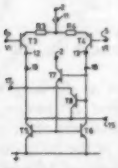
Filed Jul. 12, 1989, Ser. No. 378,959

Claims priority, application Netherlands, Mar. 2, 1989, 8900507

Int. Cl.[5] H03G 3/30; G01R 21/00

U.S. Cl. 330—2 30 Claims





14. An amplifier arrangment with saturation detection, comprising an input stage comprising a differential pair having a first input terminal and a second input terminal and a first output terminal and a second output terminal, an output stage coupled to said input stage and comprising at least one output transistor and having an output terminal coupled to the first input terminal via a coupling network, and a detection device having an output terminal for supplying a detection signal when said at least one output transistor is saturated, the detection device comprising a comparator having a first input terminal and a second input terminal respectively connected to the first output terminal and the second output terminal of the differential pair and having an output terminal coupled to the output terminal of the detection device, characterized in that the comparator comprises a transistor having a base-emitter path connected between the first input terminal and the second input terminal of the comparator and having a collector connected to the output terminal of the comparator.

4,945,315

METHOD OF AND APPARATAUS FOR PROJECTING A LASER BEAM INTO LIGHT AMPLIFIER

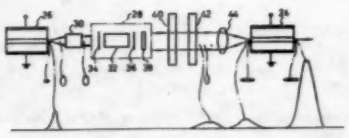
Hidetoshi Shinada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1988, Ser. No. 263,767

Claims priority, application Japan, Oct. 28, 1987, 62-272713

Int. Cl.[5] H01S 3/00

U.S. Cl. 330—4.3 7 Claims



1. A method of projecting an incident laser beam into a light amplifier, said laser beam being projected into a light waveguide region of said light amplifier in which a width of said light waveguide region is equal to or greater than a predetermined value, comprising the steps of:

making the intensity distribution of said laser beam coincide with an electromagnetic field distribution in a fundamental mode of said light waveguide region; and

subsequently projecting said laser beam into said light waveguide region.

4,945,316

VOLTAGE FOLLOWER WITH PULL-APART CONECTOR

Mark D. Sebald, Caledonia, and Richard E. Neumeyer, Rockford, both of Ill., assignors to Barber-Colman Company, Rockford, Ill.

Division of Ser. No. 175,865, Mar. 31, 1988, Pat. No. 4,872,213. This application Jun. 16, 1989, Ser. No. 367,339

Int. Cl.[5] H03F 1/34

U.S. Cl. 330—110 2 Claims

1. In apparatus for feeding a voltage signal from a source to a load via a pull-apart connector, the combination comprising

(a) a high gain summing amplifier having non-inverting and inverting input terminals and an output terminal,

(b) means for coupling said voltage signal from said source to said non-inverting input terminal,

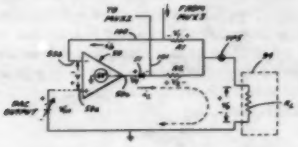
(c) a pull-apart connector having first and second output members separably engageable respectively with first and second input members, said members when engaged inevitably creating first and second contact resistances,

(d) means coupling the output terminal of said amplifier to said second input member,

(e) a terminal point electrically joined directly to said first and second output members and adapted for connection to said load, said coupling means including an asymetrically

conductive diode poled to pass current from said amplifier output terminal to said load via said second resistance and said terminal point, and

(f) a direction connection from said first input member to said inverting input terminal to create a negative feedback



loop for said amplifier, said first contact resistance residing electrically in said negative feedback loop with the feedback voltage being taken from a point downstream of said second resistance where the voltage applied to the load exists.

4,945,317

MATCHING CIRCUIT

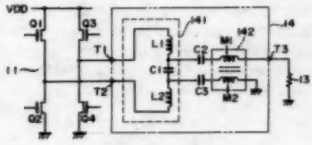
Tutomu Sato, Kawasaki; Haruhiko Yura, Yokohama; Yoshihiko Nasu, Tokyo; Atsumi Fujiwara, Tokyo, and Shigeo Mori, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 20, 1988, Ser. No. 246,780

Claims priority, application Japan, Sep. 22, 1987, 62-238140; Sep. 22, 1987, 62-238141

Int. Cl.[5] H03H 7/00

U.S. Cl. 330—301 **14 Claims**



1. A matching circuit with a pair of balanced signal input terminals and an unbalanced signal output terminal, comprising:

impedance transforming means having first and second input terminals connected to said pair of balanced signal input terminals, and first and second output terminals, a filter circuit being interposed between said first and second input terminals and said first and second output terminals, said filter circuit exhibiting a low impedance for the frequency of a signal to be transmitted from said first and second input terminals to said first and second output terminals and exhibiting a high impedance for a frequency which is higher than the frequency of the signal to be transmitted;

balance-to-unbalance transforming means having third and fourth input terminals, an output terminal connected to said unbalanced signal output terminal, a reference potential point, and a transformer including at least first and second windings, said first winding being interposed between the third input terminal and the output terminal, and said second winding being interposed between the fourth input terminal and the reference potential point; and

DC component blocking means including a coupling capacitor for removing DC components, through which the first output terminal of said impedance transforming means is connected to the third input terminal of said balance-to-unbalance transforming means, and a coupling capacitor for removing DC components, through which the second output terminal of said impedance transforming means is connected to the fourth input terminal of said balance-to-unbalance transforming means.

4,945,318

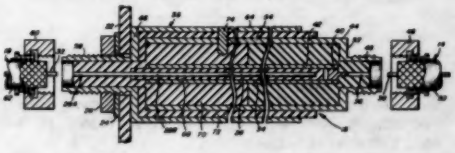
LOW FREQUENCY ISOLATOR FOR RADIO FREQUENCY HYPERTHERMIA PROBE

Jeffery L. Kabachinski, Boynton Beach, Fla., and Richard W. Fetter, Colgate, Wis., assignors to Labthermics Technologies, Inc., Champaign, Ill.

Filed Mar. 1, 1988, Ser. No. 162,631

Int. Cl.[5] H01P 1/202, 1/212

U.S. Cl. 333—12 **4 Claims**



1. An isolator insertable in a RF supply line extending from a source of RF energy to a device employing the RF energy, said isolator providing isolation to the device against DC and low frequency AC while passing RF energy of a selected frequency, said RF supply line having an center conductor and an exterior conductor, said isolator comprising:

a central conductor connectable to the center conductor of the RF supply line at a first end of said isolator, said central conductor comprising two longitudinally adjacent parts;

an inner conductor spacedly surrounding said central conductor, said inner conductor being connectable to the center conductor of the RF supply line at a second end of said isolator, said central and inner coaductors being electrically coupled together at the selected frequency of the RF energy;

a first outer conductor spacedly surrounding said inner conductor, said first outer conductor being connectable to the exterior conductor of the RF supply line at said second end of said isolator;

a second outer conductor spacedly surrounding said first outer conductor, said second outer conductor being connectable to the exterior conductor of the RF supply line at said first end of said isolator, said first and second outer conductors being electrically coupled together at the selected frequency of the RF energy; and

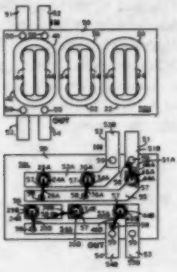
insulating means between said central and inner conductors, said inner conductor and said first outer conductor, and said first and second outer conductors.

4,945,319

HIGH FREQUENCY IMPEDANCE TRANSFORMER

Lance G. Wilson, North Hollywood, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1989, Ser. No. 387,317
Int. Cl.[5] H03H 7/38
U.S. Cl. 333—33 18 Claims



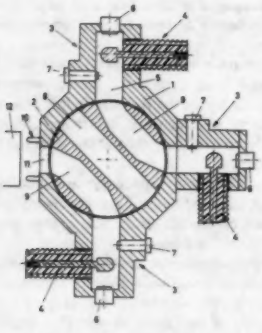
15. A high frequency impedance transformer, comprising:
three equi-length segments of coaxial transmission line, each having a central conductor and an electrically conductive coaxial shield at opposed ends thereof; and
a circuit board having substantially co-planar conductors thereon to which, at first locations, are attached the opposed ends of the coaxial shields and through which pass the central conductors without electrical contact at the first locations, and to which, at second locations, are attached the opposed ends of the central conductors.

4,945,320

MICROWAVE SWITCH HAVING AT LEAST TWO SWITCHING POSITIONS

Eckart Hettlage, Karlsruhe, and Gerd Ruff, Heidelberg, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP87/00089, § 371 Date Aug. 18, 1988, § 102(e) Date Aug. 18, 1988, PCT Pub. No. WO87/05155, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 17, 1987, Ser. No. 264,954
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605043
Int. Cl.[5] H01P 1/10
U.S. Cl. 333—106 10 Claims



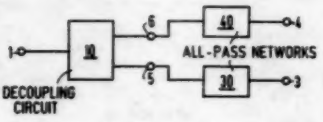
1. A waveguide switch for the selective connection of at least one coaxial input line with at least one of two output lines of which at least one is a coaxial line, comprising:
a rotor including at least one rectangular waveguide passage for conducting microwave frequencies to be transmitted, said at least one waveguide passage in said rotor having a height which is small compared with a standard waveguide for said microwave frequencies to be transmitted; a housing for rotatably supporting said rotor, said housing having a plurality of waveguide sections, each of said waveguide sections having substantially the same cross-sectional dimensions as said at least one waveguide passage; said waveguide sections of said housing being connectable with one another by said at least one waveguide passage by rotation of said rotor; and at least two of said plurality of waveguide sections each having an adapter for connection respectively to said coaxial input line and to said coaxial output line.

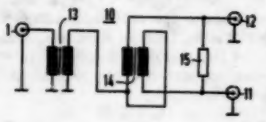
4,945,321

π/2 POWER DIVIDER

Ralph Oppelt, Weiher, and Markus Vester, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 333,287
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811986
Int. Cl.[5] H01P 5/16
U.S. Cl. 333—119 12 Claims





1. A π/2 power divider for dividing an input signal in two signal paths with the same amplitude and phase quadrature, said divider comprising:
a decoupling circuit having an input and two outputs and containing at least one line transformer; and
two unbalanced to ground all-pass networks respectively connected to said outputs of said decoupling circuit, each all-pass network consisting of a line transformer.

4,945,322

NOISE FILTER

Mitsunao Okumura, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 23, 1989, Ser. No. 327,591
Claims priority, application Japan, Mar. 23, 1988, 63-70123; Jul. 19, 1988, 63-180048; Oct. 3, 1988, 63-249594
Int. Cl.[5] H03H 7/01, 7/09
U.S. Cl. 333—184 9 Claims

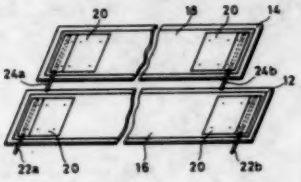
1. A noise filter, comprising:
a first longitudinal insulation sheet;
a first conductor formed on one surface of said first insulation sheet so as to be extended in a longitudinal direction of said first insulation sheet, said first conductor having a pair of ends;
two first terminals fixed on said first conductor, end portions of which are exposed in a width direction of said first insulation sheet, and one of said two first terminals being fixed near one end of said first conductor and the other of said two first terminals being fixed at a position substan-

tially removed from the other end of said first conductor and approaching said one end of said first conductor;

a second longitudinal insulation sheet above said first insulation sheet;

a second conductor formed on one surface of said second insulation sheet so as to be extended in a longitudinal direction of said second insulation sheet; and

two second terminals fixed to said second conductor, end portions of which are exposed in a width direction of said second insulation sheet, and one of said two second terminals being fixed near one end of said second conductor and the other of said two second terminals being fixed at a



position substantially removed from the other end of said second conductor and approaching said one end of said second conductor;

said first and second insulation sheets being wound together with said first and second conductors so as to form a wound unit such that end portions of said first and second terminals can be exposed from an end surface of said wound unit, inductances being respectively formed between the first terminal by said first conductor and between the second terminals by said second conductor, and distributed capacitance being formed between said first and second conductors.

4,945,323

FILTER ARRANGEMENT

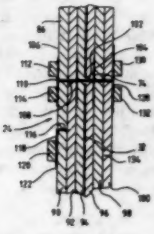
Bruno Gerstenberg, Muhlenstr. 9, 7776 Owingen; Hans J. Michling, Obertorstr. 14A, and Josef Vachek, Fichtenweg 3, both of 7770 Uberlingen, all of Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 378,147

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1988, 3823469

Int. Cl.[5] H03H *7/00*; **H05K** *3/46, 9/00*

U.S. Cl. 333—185 **6 Claims**



1. Filter arrangement for filtering a plurality of conductors which are guided from a space comprising electromagnetic fields to a device located in a shielded space, comprising

(a) a separating wall (24) in the form of a multilayer printed circuit card (26) provided with an internal instrument ground (32) and having filter members, and

(b) holes, through which signal conductors are passed through, are provided in the printed circuit card for passing signals through,

characterized in that

(c) the instrument ground is formed by a continuous surface except for narrow apertures in the area of the holes through which feed-through conductors are passed, and

(d) in addition to the internal instrument ground, additional layers having conductive surfaces are provided in the multilayer printed circuit card which conductive surfaces form with the electrically connected signal conductor, filter members preventing passage of high-frequency electromagnetic waves through the holes.

4,945,324

THIN FILM FERROMAGNETIC RESONANCE TUNED FILTER

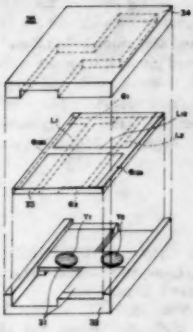
Yoshikazu Murakami; Takahiro Okajhara; Kazuko Niikura; Yasuyuki Mizunuma, all of Kanagawa, and Hiroyuki Nakano, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 127,014, Nov. 27, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 326,430

Claims priority, application Japan, Nov. 28, 1986, 61-283512; Apr. 30, 1987, 62-107350

Int. Cl.[5] H01P *1/20, 1/218, 1/217*

U.S. Cl. 333—202 **8 Claims**



1. A thin film ferromagnetic resonance tuned filter comprising:

a ferrimagnetic thin film;

an input transmission line and an output transmission line coupled to said ferrimagnetic thin film; and

a magnetic circuit applying DC magnetic field to said ferrimagnetic thin film, each of said input and output transmission lines being grounded at a grounded end respectively, wherein each distance between the center of said ferrimagnetic thin film and said grounded ends of each of said input and output transmission lines is selected one-tenth or above and less than one-fourth the wavelength of a wave transmitted in said transmission lines at an upper limit frequency of a tuning bandwidth.

4,945,325

CIRCUIT BREAKER WITH SMOOTH SLIDING OPERATION

Haruhisa Toda; Hiroaki Fujihisa, and Shiro Murata, all of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,329

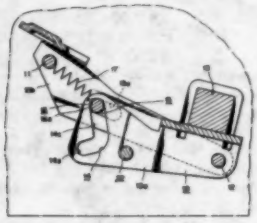
Claims priority, application Japan, Nov. 20, 1987, 62-177948[U]; Nov. 20, 1987, 62-177949[U]; Nov. 20, 1987, 62-177950[U]

Int. Cl.[5] H01H *75/00*

U.S. Cl. 335—16 **3 Claims**

1. A circuit breaker wherein, in limiting a current by separat-

ing a movable contact arm **7** under electromagnetic repulsion caused by a flow of high currents regardless of an interrupting operation of an automatic tripping device **4**, a contact arm **10** holding said movable contact arm **7** is divided into a first contact arm **310A** and a second contact arm **310B** both rotatably supported, and has a guide hole **14** provided on said first contact arm **310A** in connection with a switching mechanism **20** and extending in a direction the circuit breaker contacts are opened and closed, a long hole **15** provided on said second



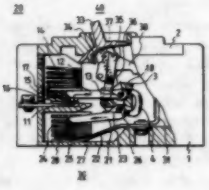
contact arm **310B** supporting said movable contact arm **7** by a first pin **11** and extending in another direction said long hole **15** intersects said guide hole **14**, a second pin **316** engaged in both said long hole **15** and said guide hole **14**, and a spring **17** which is pulling said second pin **316**; whereby at least the pin sliding surface **14***c* of said guide hole **14** of said first contact arm **310A**, and at least the pin sliding surface **15***a* of said long hole **15** of said second contact arm **310B** are surface-treated to provide both the sliding surfaces **14***c*, **15***a* with greater hardness than said second pin **316**.

4,945,326

CIRCUIT BREAKER

Kiyoshi Kandatsu, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1989, Ser. No. 329,706
Claims priority, application Japan, Apr. 18, 1988, 63-94862
Int. Cl.[5] H01H *75/00*
U.S. Cl. 335—16 **8 Claims**



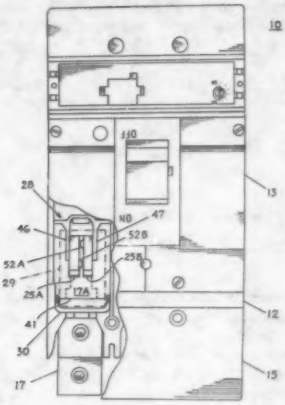
1. A circuit breaker assembly comprising:
a housing means for enclosing the circuit breaker assembly, including a substantially rectangular casing with an outer face;
a first breaking means for breaking the current, mounted within the casing;
a second breaking means for breaking the current, mounted within the casing, adjacent said first breaking means, and connected in series with said first breaking means;
a switching means for manually tripping said first and second breaking means;
an overcurrent tripping device operable to trip said first breaking means in an overcurrent condition; and
an insulating switching shaft mounted in the casing, disposed to support both the first and second breaking means.

4,945,327

MOLDED CASE CIRCUIT BREAKER VARIABLE ARC EXHAUST SHIELD

Dennis J. Doughty; Raymound K. Seymour, both of Plainville, and Aymon A. Maulandi, Plantsville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 5, 1989, Ser. No. 402,302
Int. Cl.[5] H01H *9/30*
U.S. Cl. 335—201 **11 Claims**



1. A molded case circuit breaker comprising:
a plastic case and a plastic cover, said cover being attached to said case;
a fixed contact arm connected to a line terminal at one end of said case, said fixed contact arm carrying a fixed contact at one end thereof;
a first movable contact arm connected to a load terminal at an opposite end of said case, said first movable contact arm carrying a movable contact at one end thereof;
an operating mechanism within said case and arranged for separating said fixed and movable contacts upon occurrence of an overcurrent condition in excess of a predetermined magnitude;
an arc chute arranged over said movable contact arm for cooling and extinguishing an arc which occurs upon separation of said contacts;
a movable contact arm guide arranged intermediate said operating mechanism and said arc chute, said guide including opposing sidewalls thereby confining movement of said first movable contact arm to a predetermined direction; and
a second moveable contact arm parallel to and electrically connected with said first movable contact arm, said first movable contact arm having means on a surface abutting said second contact arm for contacting said second contact arm and preventing said second contact arm from becoming distorted upon said overcurrent occurrence.

4,945,328

ELECTRICAL CONTACTOR

John W. Kinney, Aurora; Anthony P. Ruhasch, St. Charles, and Thomas W. Degenhart, Batavia, all of Ill., assignors to Furnas Electric Company, Batavia, Ill.

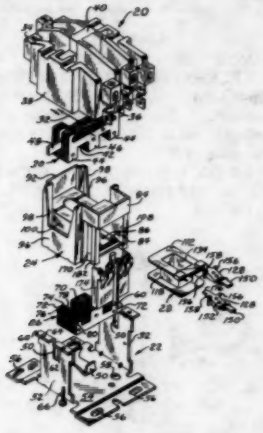
Filed Oct. 31, 1988, Ser. No. 265,005
Int. Cl.[5] H01H *9/02*
U.S. Cl. 335—202 **11 Claims**

1. In a contactor, the combination of:
a base;
a contactor assembly, including at least one movable contact, mounted on said base;

a magnetic core mounted on said base in proximity to said contactor assembly;

a bobbin mounted on said magnetic core and having spaced flanges defining a peripheral winding receiving recess, at least one of said flanges having terminal receiving recesses in an edge thereof;,

metallic pins, one for each terminal receiving recess, each having one end captured in said edge adjacent the corresponding terminal receiving recess and an opposite end



projecting away from the corresponding terminal receiving recess;

an electrical winding in said winding receiving recess and having ends extending therefrom and wrapped about a corresponding one of said pins; and

a plurality of metallic terminals, one for each terminal receiving recess, and having a mounting end disposed in the corresponding recess and a finger crimped about the corresponding pin and the winding end wrapped thereabout.

4,945,329

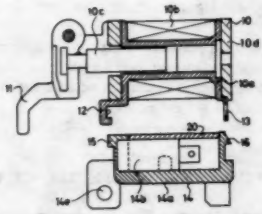
TRIPPING DEVICE WITH BURNING PREVENTION SWITCH

Kazuyoshi Sugihara, and Ichiro Arinobu, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 10,581, Feb. 3, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 260,133

Int. Cl.[5] H01F *1/00*

U.S. Cl. 335—219 **3 Claims**



1. An electromagnet tripping switch assembly with nondestructive burning protection, comprising:

a bobbin;

electromagnet means having a coil wound on said bobbin;

plunger means disposed within said electromagnet means and driven by said electromagnet means;

an insulating case having first and second projecting;

burning prevention means in a circuit with said coil within said insulating case; and

means for interconnecting said bobbin and said insulating case, said interconnecting means comprising a channel section portion formed in one portion of said bobbin for receiving said first projection of said insulating case another portion of said bobbin having a through-hole for receiving said second projection of said insulating case.

4,945,330

ACTUATOR

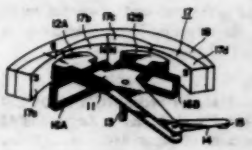
Yoji Arita, Yokohama, Japan, assignor to Mitsubishi Kasei, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 329,321

Claims priority, application Japan, Mar. 28, 1988, 63-71928; Oct. 15, 1988, 63-258364

Int. Cl.[5] H01F *7/08*

U.S. Cl. 335—229 **12 Claims**



1. An actuator comprising:

an armature having at least one pair of protruding poles and movable so that each of said protruding poles is movable along a predetermined path;

a coil disposed to surround each of said protruding poles and adapted for energizing same such that said protruding poles are energized in opposite polarities to each other;

a stationary yoke extending in the direction parallel to said path; and

a permanent magnet composed of plural pairs of juxtaposed magnetic pieces whose magnetic polarities are opposite to each other, said plural pairs of magnetic pieces corresponding in number to the number of said protruding poles and mounted on said yoke in juxtaposition with each other at positions adjacent to the path of the corresponding protruding pole, adjacent two magnetic pieces of adjacent pairs having the same polarity with each other, and said permanent magnet generating such a magnetic flux pattern that the amount thereof gradually decreases from both ends of the path of each protruding pole towards the boundary of the magnetic pieces of the corresponding pair.

4,945,331

ELECTROMAGNETIC ACTUATOR

Tadashi Kashio, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 385,001

Claims priority, application Japan, Jul. 29, 1988, 63-101520

Int. Cl.[5] H01F *7/08*

U.S. Cl. 335—274 **7 Claims**

1. An electromagnetic actuator comprising:

a base plate;

a solenoid for producing a magnetic attractive force upon supply of an electric current thereto;

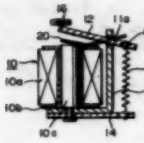
a yoke disposed on said base plate with said solenoid for introducing a magnetic flux produced by said solenoid;

an armature having one end rotatably supported by said

yoke and the other end attracted toward an end surface of a core of said solenoid;

a return spring stretched in a state of tension between said base plate and the end of said armature for urging said armature to be released from said solenoid; and

a return leaf spring interposed between said core and said armature and formed of a non-magnetic material, said



return leaf spring having a V-shaped configuration with the bent portion of the convex side being in contact with the end surface of said solenoid;

whereby said armature is deflected to store supplemental releasing force for said armature when said solenoid attracts said armature, and powerful releasability is provided by the restoring force of said return leaf spring.

4,945,332

NOISE SUPPRESSION INDUCTOR

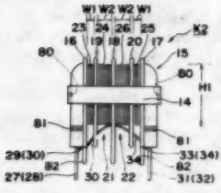
Yukio Sakamoto, Fukui; Mamoru Zushi, and Masahiro Bando, both of Takefu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 902,954, Sep. 2, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 281,900

Claims priority, application Japan, Sep. 3, 1985, 60-195040

Int. Cl.[5] H01F *15/14, 27/30;* **H03H** *7/00*

U.S. Cl. 336—69 **5 Claims**



1. A noise suppression inductor comprising:

a bobbin having first and second flange portions at opposite ends thereof, respectively, a central flange portion at a substantially central location between said first and second flange portions and at least one partition plate between each of said first and second flange portions and said central flange portion, said partition plates dividing the respective distances between said first and second flange portions and said central flange portion so as to form a plurality of coil winding portions having different winding widths, respectively;

a core mounted on said bobbin;

a pair of first pin terminals and a pair of second pin terminals which are attached to said bobbin;

first and second coils which have first opposite ends and second opposite ends, respectively, said first opposite ends of said first coil, respectively, being connected to said first pin terminals, and said second opposite ends of said second coil being, respectively, connected to said second pin terminals;

said first and second coils each being wound around said coil winding portions through said partition plate so as to form a plurality of coil portions on said coil winding portions, respectively, such that magnetic fluxes of said first and second coils eliminate each other;

said coil portions of each of said first and second coils having a plurality of different stray capacities, respectively, so as to have a plurality of different self-resonance frequencies, respectively, whereby when said first and second coils are connected in a circuit with noise in the range of said self-resonance frequencies, each of said first and second coils is capable of cancelling noises of a plurality of different frequency bands.

4,945,333

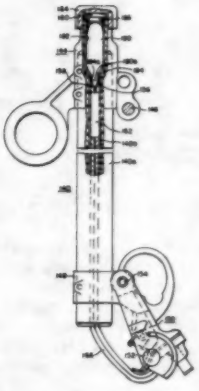
FUSE ASSEMBLY, FOR A CUTOUT, WITH ACCELERATED ARC EXTINCTION

Nicholas J. Stroud, Muncie; Andrew S. Sweetana, Jr., Bloomington; Frederick J. Brown, Bloomington, and Thomas P. Bass, Bloomington, all of Ind., assignors to Asea Brown Boveri Inc., Purchase, N.Y.

Filed Feb. 13, 1989, Ser. No. 309,747

Int. Cl.[5] H01H *71/10, 85/40*

U.S. Cl. 337—176 **7 Claims**



1. A fuse assembly, such as for a cutout, comprising:

a tube of insulating material containing a fusible element connected between first and second conductive elements, said fusible element producing an arc upon operation;

a gas capsule proximate said first conductive element and said fusible element and containing pressurized gas released by action of the arc produced by operation of said fusible element to cool and quench the arc and to force stagnant ionized gas out of said tube;

said second conductive element comprising a rigid conductor at said fusible element with a flexible conductor attached to said rigid conductor and extending from said tube;

a spring loaded flipper connected to said second conductive element that withdraws said second conductive element from said tube upon operation of said fusible element to assist further in arc extinction.

4,945,334

ENERGIZING MEANS FOR ELECTRONIC WARNING APPARATUS

James E. Biersach, Mequon, Wis., assignor to Alerting Communicators of America, Mequon, Wis.

Filed May 8, 1989, Ser. No. 348,971

Int. Cl.[5] G08B *3/00;* **G01K** *9/00*

U.S. Cl. 340—388 **5 Claims**

1. An electronic alerting and warning device for converting

at least 5 kW of electrical power to a high volume sound output, comprising, in combination:

A. a number of substantially identical electromagnetic drivers for converting electrical energy to acoustical energy, each said driver comprising:

(1) a diaphragm having front and rear sides,

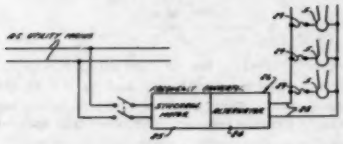
(2) a rigid housing across which said diaphragm extends and which cooperates with the diaphragm to define

(a) at the rear side thereof a totally enclosed rear chamber and

(b) at the front side thereof a front chamber wherein there is a driver port that provides for acoustic loading of the diaphragm,

(3) a permanent magnet fixed in said rear chamber, and

(4) a coil fixed to said rear side of the diaphragm and



capable of being duty energized with a power on the order of 100 W by an a.c. that impresses on the order of 40 V across the coil,

said number of drivers being such that the coils of all of said drivers can, together, consume said at least 5 kW of power;

B. a rotary alternator which, when driven at a predetermined rotational speed, produces an alternating current

(1) of substantially sine-wave form

(2) having a frequency within the range of about 200 HZ to about 800 HZ and

(3) having a voltage on the order of 40 V;

C. conductor means connecting the coils of said drivers, in parallel with one another, with said rotary alternator; and

D. powered means for driving the rotary alternator at said predetermined rotational speed.

4,945,335

ELECTRONIC UNIT OPERABLE IN CONJUNCTION WITH BODY UNIT

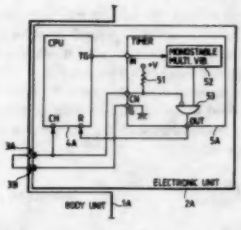
Toshiyuki Kimura; Youichi Yamazaki; Yoshiya Nonaka; Yasunao Go; Fumio Endo; Hiroyuki Komata, and Mitsuo Syoji, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,420

Claims priority, application Japan, Oct. 6, 1988, 63-250795

Int. Cl.[5] B60R *25/10*; H04B *1/06*

U.S. Cl. 340—426 **4 Claims**



1. An electronic unit operable in conjunction with a body unit comprising:

a coupled/decoupled status signal generating means for generating a coupled-status signal when said electronic unit is coupled to said body unit and a decoupled-status signal when said electronic unit is decoupled from said body unit;

a microcomputer coupled to said coupled/decoupled status signal generating means, said microcomputer being selectively placed to a start mode when said coupled-status signal is received from said coupled-decoupled status signal generating means and to a stop mode when said decoupled-status signal is received therefrom, said microcomputer producing clock pulses when placed in said start mode and a stop signal when placed in said stop mode; and

a timer coupled to both said microcomputer and said coupled/decoupled status signal generating means, said timer outputting a reset signal to said microcomputer for resetting said microcomputer when said clock pulses fed from said microcomputer are interrupted for more than a predetermined period of time, and inhibiting said reset signal from being outputted from said timer when said stop signal is supplied, said timer being directly supplied with said decoupled status signal from said coupled/decoupled status signal generating means for controlling the output of said reset signal.

4,945,336

TROUBLE DETECTION APPARATUS FOR AUTOMOBILE AIR-BAG SYSTEM

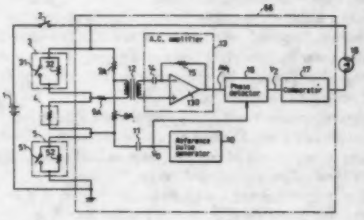
Hisatsugu Itoh, and Munehiro Kawabata, both of Sanda, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,374

Claims priority, application Japan, May 12, 1988, 63-117701

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 340—438 **1 Claim**



1. A trouble detection apparatus for an automobile air-bag system comprising:

a Wheatstone bridge circuit including two resistors, together with a resistor connected between contacts of an acceleration speed sensor, and an internal resistance of a trigger means for inflating the air-bag;

a reference pulse generator for supplying pulse signals to said Wheatstone bridge circuit;

a current transformer connected across output terminals of said Wheatstone bridge circuit for producing a signal having no D.C. component;

an A.C. amplifier for amplifying signals issued from said current transformer;

a phase detector for phase detection of an output of said A.C. amplifier; and

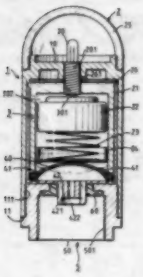
a comparator for comparing an output of said phase detector with a reference signal and for producing a signal indicative of said resistor connected between said contacts of said acceleration speed sensor or the internal resistance of said trigger means.

4,945,337

TIRE PRESSURE INDICATOR

Tien-Tsai Huang, No. 4, Lane 30, Wu-Chang St., Pan-Chiao City, Taiwan

Filed Sep. 14, 1989, Ser. No. 407,351
Int. Cl.[5] B60C 23/00
U.S. Cl. 340—442 4 Claims



1. A tire pressure indicator having a hollow cylindrical body formed with a closed side at one end thereof and an open side at another end thereof for being positioned on a tire valve of an associated tire with a light bulb being detachably mounted in a threaded central opening formed in the closed side of the hollow cylindrical body, comprising:

a transparent light cover screw-connected to the closed side of the hollow cylindrical body over the light bulb thereof;

a first conductor member having a central opening formed therein disposed on a bottom surface of the closed side of the hollow cylindrical body and engaged with a threaded negative portion of the light bulb through the central opening of said first conductor;

a piston container with an upper closed side thereof and an lower open side thereof screw-connected to the threaded negative portion of the light bulb at said upper closed side in the hollow cylindrical body;

a sleeve member with a closed side located at a lower end thereof movably disposed in the hollow cylindrical body with said piston container being sleevingly received therein;

a piston means movably disposed in an inner chamber of said piston container so as to be controlled by the tire pressure of an associated tire for turning the light bulb on and off in conjunction with the tire pressure condition of the associated tire;

a pressure sensing means fixedly provided on the closed side of said sleeve member under said piston means for being detachably connected to the tire valve of the associated tire to monitor and indicate the pressure condition of the associated tire; and

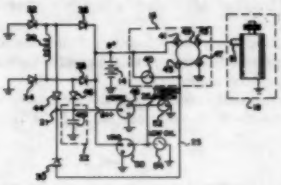
a supporting base, having an air chamber formed therein with internal and external threads provided therearound, screw-connected to the open side of the hollow cylindrical body for being detachably connected to the tire valve of the associated tire; whereby, with said tire pressure indicator being detachably connected to an associated tire, the pressure condition of the associated tire can be monitored and indicated via the light bulb without incurring any air pressure leakage therefrom even when the hollow cylindrical body is damaged or loosened.

4,945,338

ALTERNATOR POWERED MOTOR WARNING SYSTEM

Philip A. Anderson, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 23, 1989, Ser. No. 299,145
Int. Cl.[5] B60Q 11/00
U.S. Cl. 340—459 20 Claims



1. A warning system for an internal combustion engine without a switched B^+ power line and having an alternator connected to and charging a battery, said system comprising:

power supply means connected between said alternator and an auxiliary power supply node, said power supply means adapted to supply power to said power supply node only when said alternator is rotating;

annunciator means for alerting an operator of an abnormal condition of the engine, said annunciator means connected between said power supply node and a common node; and

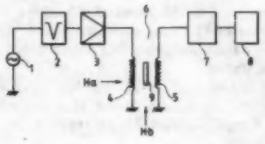
sensing means, connected between said common node and a reference voltage, for connecting said common node to said reference voltage when an abnormal condition of the engine is sensed thereby enabling said annunciator means.

4,945,339

ANTI-THEFT SENSOR MARKER

Kiyotaka Yamauchi, and Yoshihito Yoshizawa, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,791
Claims priority, application Japan, Nov. 17, 1987, 62-290366
Int. Cl.[5] G08B 13/24
U.S. Cl. 340—551 13 Claims



1. An anti-theft sensor marker mainly composed of an alloy and employed in an anti-theft system in which the unlawful taking of a commodity marked by said marker is determined by detecting a magnetic field of a specific frequency with respect to an incident magnetic field intensity applied to a detection region through said alloy of said marker when said marker is disposed within said detection region, said alloy having the constitutional formula

$$(Fe_{1-a}M_a)_{100-x-y-z-\alpha-\beta-\gamma}Cu_xSi_yB_zM'_\alpha M''_\beta X_\gamma$$

(atomic %)

wherein, M is at least one member selected from the group consisting of Co and Ni; M' is at least one member selected from the group consisting of Nb, W, Ta, Zr, Hf, Ti and Mo; M'' is at least one member selected from the group consisting of V, Cr, Mn, Al, platinum metals, Sc, Y, rare-earth metals, Au, Zn, Sn and Re; X is at least one member selected from the

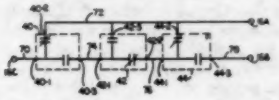
group consisting of C, Ge, P, Ga, Sb, In, Be and As; and a, x, y, z, α, β and γ satisfy the relations: $0 \leq a \leq 0.3$, $0.1 \leq x \leq 3$, $6 \leq y \leq 25$, $3 \leq z \leq 15$, $14 \leq y+z \leq 30$, $1 \leq \alpha \leq 10$, $0 \leq \beta \leq 10$, $9 \leq \gamma \leq 10$, and wherein at least 50% of the structure of the alloy ribbon is composed of fine bccFe solid-solution crystalline grains in which the mean grain diameter, measured as a maximum grain diameter, is not larger than 500 Å.

4,945,340

TAMPER-RESISTANT MAGNETIC SECURITY SYSTEM

Henry L. Brill, Flushing, N.Y., assignor to Pittway Corporation, Syosset, N.Y.

Filed Apr. 25, 1989, Ser. No. 343,483
Int. Cl.[5] G08B 13/08
U.S. Cl. 340—547 **17 Claims**



1. A security system for use in a physical security monitoring environment, said system comprising

a sensor unit having a common conductor, an alarm conductor, and a guard conductor and at least three switches, each of said switches having a deactivated condition and an activated condition and being adapted to be placed in its activated condition in response to a magnetic field of predetermined magnetic flux density;

said sensor unit having a logic circuit electrically interconnecting said switches and said common conductor, said alarm conductor and said guard conductor, said logic circuit completing a series circuit between said common conductor and said guard conductor whenever a predetermined one of said switches is in a deactivated condition and the remaining switches are in an activated condition, and completing a circuit between said common conductor and said alarm conductor when either all of said switches are in an activated condition or one of said remaining switches is in a deactivated condition; and

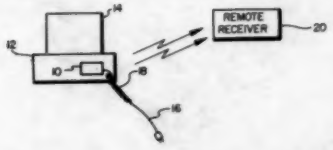
an actuator unit with at least two permanent magnets, the number of said permanent magnets being one less than the number of said switches and each said permanent magnet providing a discrete magnetic field of predetermined flux density sufficient to activate a corresponding one of said switches when said actuator unit is located in a predetermined juxtaposition with respect to said sensor unit.

4,945,341

ALARM SYSTEM FOR ELECTRICAL DEVICES

Gregory J. Buttimer, 25 S. Iowa Ave., Addison, Ill. 60101

Filed Apr. 5, 1989, Ser. No. 333,470
Int. Cl.[5] G08B 13/22
U.S. Cl. 340—568 **9 Claims**



1. An apparatus comprising:

an electrical device having an electrical power cord, said electrical power cord comprising two conductors surrounded by an insulating coating;

a wire wrapped around said power cord of said electrical device, said wire making substantial contact with said insulating coating of said power cord, said wire having a length in the range of about 12 inches to about 36 inches, said wire being wrapped around said power cord at least about five times so that said wire is capable of sensing the connection of said power cord to a source of AC power whether or not said electrical device is turned on;

an amplifier electrically coupled to said wire, said amplifier detecting when said power cord of said electrical device is disconnected from the source of AC power;

a transmitter electrically coupled to said amplifier, said transmitter generating an RF alarm signal upon said amplifier's being turned off in response to said power cord's being disconnected from the source of AC power; and

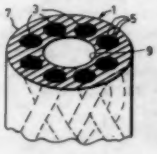
a receiver remote from said transmitter, said receiver receiving said RF alarm signal from said transmitter and generating a second alarm signal in response to receiving said RF alarm signal.

4,945,342

ELECTRICAL CABLE FOR PERFORMING STIMULATIONS AND/OR MEASUREMENTS INSIDE A HUMAN OR ANIMAL BODY AND METHOD OF MANUFACTURING THE CABLE

Samuel G. Steinemann, St. Sulpice, Switzerland, assignor to Institt Straumann, Switzerland

Filed Oct. 5, 1988, Ser. No. 254,367
Claims priority, application Switzerland, Oct. 16, 1987, 4082/87
Int. Cl.[5] H01B 5/68
U.S. Cl. 174—113 R **37 Claims**



1. Electrical cable for performing stimulations and/or measurements inside a human or animal body, for instance for a cardiac pacemaker, the cable comprising at least one bundle of fibers, wherein each fiber is less than 20 micrometers thick and has a cross-sectional area of a single metallic material.

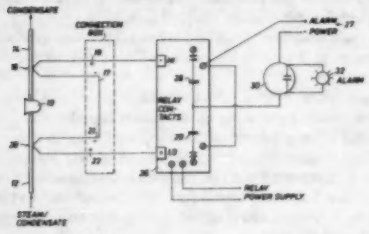
23. Method of manufacturing an electrical cable for performing stimulations and/or measurements inside of a human or animal body, the cable comprising at least one bundle of fibers which are less than 20 micrometers thick, the method comprising the steps of: providing a number of wires thicker than the fibers and made of the same metallic material as the fibers to be produced; imbedding the thicker wires into a matrix consisting of a different metallic material; subjecting the thicker wires together with the matrix to a deformation process during which the wires are made longer and thinner; and, subsequently dissolving the matrix with an acid to yield a bundle of said fibers.

4,945,343

SYSTEM AND METHOD FOR DETECTION OF MALFUNCTIONING STEAM TRAPS

Richard Rodriguez, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1989, Ser. No. 374,377
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—606 5 Claims



1. System for continuous detection of a steam trap for malfunctioning which comprises

a steam trap having an inlet communicating with a source of steam, and having an outlet for discharge of gases which are noncondensable, and condensate;

sensing means for detecting malfunction of said steam trap, said sensing means comprising a pair of thermocouples including a first thermocouple disposed proximate and in temperature measurement relationship to said outlet for measuring the temperature of said outlet and a second thermocouple disposed proximate and in temperature measurement relationship to said inlet for measuring the temperature of said inlet;

signal generating means operatively connected to said sensing means for generating a signal indicative of malfunction of said steam trap; and

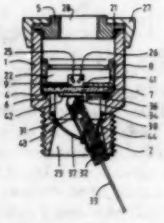
signal indicating means responsive to said generated signal for indicating malfunctioning of said steam trap.

4,945,344

FLUID FLOW SENSOR HAVING LIGHT REFLECTIVE SLIDER

Jonathon E. Farrell, and Mark C. Anthony, both of 8 Chomley Street, Cranbourne, Victoria, Australia 3977

Filed Nov. 23, 1987, Ser. No. 123,678
Claims priority, application Australia, Nov. 24, 1986, PH9156
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—610 4 Claims



1. A flow sensor comprising:

a body,

a partition dividing the body into first and second ends, the partition being fluid tight and capable of transmitting light,

light emission means located in the first end and adapted to transmit light through the partition toward the second end,

slider means located in said second end and adapted to be moved between first and second positions with respect to the partition, said slider means having a surface substantially abutting said partition and having a substantially light reflective portion and a substantially light unreflective portion which will, respectively, substantially reflect light from the light emission means back through the partition towards the first end when said slider means is in said first position and substantially not reflect light back through said partition towards the first end when said slider means is in said second position,

a light detector means located in the first end and adapted to produce an output signal when receiving light reflected through said partition toward the first end by said surface when in the first position,

wherein the second end is adapted to be connected to a pipe or other structure within which fluid may flow, and

mechanical means incorporated in said second end and movable, in use, by fluid flowing in said pipe or other structure and operative when so moved to move said slider means from said second position to said first position.

4,945,345

CIRCUIT BREAKER SIGNAL

Ross Proctor, 162 Fox St., Bridgeport, Conn. 06605, and Emilio Ruiz, 1463 Black Rock Turnpike No. 11, Fairfield, Conn. 06430

Filed Aug. 8, 1989, Ser. No. 390,803
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—638 9 Claims

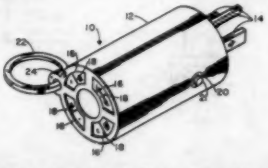
1. A circuit breaker signal for use with at least one circuit breaker each circuit breaker having a switch assembly comprising a housing supportable externally of said circuit breaker, indication means coupled to said housing for indicating when a circuit breaker has been activated and indicating which circuit breaker has been activated, and switch means supported on said housing for coming in contact with said switch assembly when the circuit breaker is activated and causing said indication means to indicate activation.

4,945,346

AUDIBLE CIRCUIT TRACER

John P. Schmiemann, 4 Seville La., Story Brook, N.Y. 11790

Filed Aug. 7, 1989, Ser. No. 390,289
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—656 2 Claims



1. A portable electric power indicator assembly comprising:

a. a palm size cylindrical housing having electric prongs at one end for plugging into an electrical outlet;

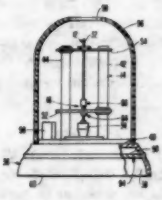
b. said housing having mounted in the other end thereof a piezo energized buzzer and including an attachment for carrying said housing on a tool belt;
c. a step down transformer within said housing having the primary coil thereof connected to two of said electric prongs;
d. a full wave bridge rectifier;
e. electrical conductors connecting the second coil of said transformer to said piezo buzzer through said rectifier so that only dc will be delivered to said buzzer;
f. openings at the end of said housing opposite the end carrying said prongs for broadcasting the buzzer sounds when said piezo buzzer is activated, said openings having adjustable shutters for permitting said sounds to be selectively baffled;
g. an adaptor for checking a bulb socket, said adaptor comprising a threaded male member at one end to thread into said bulb socket and openings at the other end for receiving said prongs on said housing; and
h. an adaptor for checking hard-wired electrical equipment, said adaptor comprising a member having openings for receiving said prongs and leads connected to said openings terminating in insulated alligator clips for electrical engagement to said equipment.

4,945,347

MOTION AND ORIENTATION RESPONSIVE DEVICE FOR SEISMIC, INTRUSION, AND TILT ALARMS AND THE LIKE

John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008

Filed Mar. 17, 1988, Ser. No. 169,318
Int. Cl.[5] G08B *21/00*; H01H *35/02*
U.S. Cl. 340—689 **39 Claims**



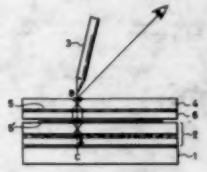
1. A motion and orientation responsive device comprising:
a pendulum having normally upper and lower ends, and a center of mass at said lower end,
a pendulum support,
pivot means pivotally mounting said pendulum between its ends on said support for swinging of the pendulum about a pivot point located close to said mass center such that the pendulum length between said pivot point and said upper pendulum end is several times the pendulum length between said pivot point and said mass center, whereby the pendulum has a normal generally vertical position relative to the gravitational field wherein said center of mass is situated below said pivot means, and
a zero position reference member mounted on said support at said upper pendulum end for cooperation with said upper pendulum end to indicate movement of said pendulum from said normal position thereof.

4,945,348

LIQUID CRYSTAL DISPLAY COMBINED WITH SIGNAL INPUT TABLET

Masahiko Ibamoto, Katsuta; Satoshi Shimada, Hitachi; Shinji Obyama, Hitachi; Manabu Sato, Hitachi; Soshiro Kuzunuki, Katsuta, and Mitsunari Kano, Seto, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,225
Claims priority, application Japan, Apr. 22, 1987, 62-97362
Int. Cl.[5] G09G *3/18*
U.S. Cl. 340—784 **14 Claims**



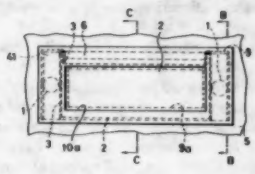
1. In a liquid crystal display combined with a signal imput tablet comprising a tablet for detecting a planar write position by a hand-writing input pen, a liquid crystal display disposed on said table and a transparent protective plate disposed on said liquid crystal display and having a light diffusion operation, the improvement comprising a two-dimensional lens array disposed as one-to-one erect imaging optical system between said liquid crystal display and said transparent protective plate so that the display image can be projected as the same size erect image on the surface of said transparent protective plate thereby elementating parallax otherwise existing between the liquid crystal display and the input panel.

4,945,349

LIQUID CRYSTAL DISPLAY

Yukiharu Sanai, Sanda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,250
Claims priority, application Japan, Sep. 28, 1987, 62-240914
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **9 Claims**

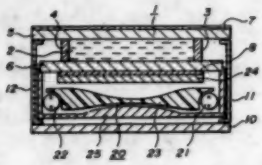


1. A liquid crystal display comprising:
a liquid crystal display board;
a light guide which is disposed at a rear side of said liquid crystal display board;
a light source which is disposed at said rear side of the liquid crystal display board;
a filter which is disposed between said liquid crystal display board and said light guide;
shade means which is of high thermal conductivity and is disposed between said light source and said filter for selectively shading heat coming from said light source toward said filter; and
at least one case which covers said liquid crystal display board, said light guide, said light source, said filter and said shade means therewith, said case having an opening to show said liquid crystal display board therethrough.

4,945,350
LIQUID CRYSTAL DISPLAY UNIT

Yasukazu Kawamura, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 882,677, Jul. 7, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 338,383
Claims priority, application Japan, Jul. 9, 1985, 60-150556; Jul. 9, 1985, 60-150557
Int. Cl.[5] G09G 3/36
U.S. Cl. 340—784 12 Claims



1. A liquid crystal display unit for displaying characters and/or images comprising:

a liquid crystal display panel including a liquid crystal interposed between first and second transparent plates, a first polarizing plate disposed on the upper surface of said first transparent plate, and a second polarizing plate disposed on the rear surface of said second transparent plate;

a substrate carrying an electric circuit for driving said liquid crystal display panel;

means for interconnecting said electric circuit and said liquid crystal display panel;

a planar light source disposed between said liquid crystal display panel and said substrate and comprising two linear fluorescent lamps and a light guiding member, said light guiding member comprising a light guiding plate extending subtantially in parallel with said liquid crystal display panel and disposed substantially in a first plane, said linear fluorescent lamps being disposed at opposite side surfaces of said light guiding plate and extending substantially in parallel to each other and disposed in said first plane, said light guiding plate including means for controlling light coupling so as to direct light substantially orthogonal to said first plane direction and toward said liquid crystal display panel;

said light guiding plate having opposite upper and lower surfaces, said upper surface facing said liquid crystal display panel, said means for controlling light coupling from the light guiding plate comprising a concave surface portion on each of the upper and lower surfaces of said light guiding plate to enhance uniformity of brightness;

a casing for containing said fluorescent lamps and light guiding member and including a reflecting plate for efficiently and uniformly utilizing the light from the fluorescent lamps;

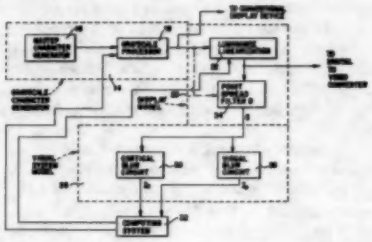
said casing reflecting plate extending under said light guiding plate and having a convex surface portion disposed adjacent to and in symmetric alignment with the concave surface portion of said lower surface of said means for controlling light coupling, and end walls disposed closely adjacent respective linear fluorescent lamps for reflecting light therefrom;

wherein said casing member and said planar light source contained therein are disposed between said liquid crystal display panel and said substrate and are detachably mounted to the rear surface of said liquid crystal display panel, thereby said planar light source illuminates said liquid crystal display panel with uniform intensity from behind.

4,945,351
TECHNIQUE FOR OPTIMIZING GRAYSCALE CHARACTER DISPLAYS

Abraham C. Naiman, Toronto, Canada, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 23, 1988, Ser. No. 197,420
Int. Cl.[5] G09G 1/14
U.S. Cl. 340—793 20 Claims



1. A method for calibrating luminance linearization values for sub-pixel edge placements in a grayscale display device, comprising the steps of:

displaying a first field on a first area of said display device, said first field having a sharp transition line separating a first white field portion and a first black field portion;

substantially concurrently displaying a second field on a second area of said display device adjacent said first area, said second field having a second white field portion and a second black field portion separated by an intermediate gray strip, said gray strip being substantially parallel with said sharp transition line and having a height corresponding to a predetermined visual angle and a vertical position relative to said sharp transition line determined by a desired sub-pixel edge placement;

positioning a viewer at a distance from said display device calculated from said gray strip height and the predetermined visual angle;

varying the grayscale setting of the gray strip;

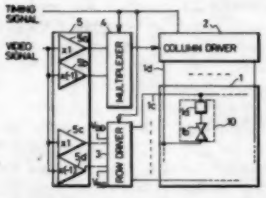
selecting the grayscale setting which minimizes line discontinuities between said sharp transition and a transition line between said second white field portion and said second black field portion perceived by said viewer;

setting a luminance linearization value corresponding to said desired sub-pixel edge placement for said display device to the grayscale setting selected by said selecting step.

4,945,352
ACTIVE MATRIX DISPLAY DEVICE OF THE NONLINEAR TWO-TERMINAL TYPE

Akira Ejiri, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Feb. 16, 1988, Ser. No. 157,045
Claims priority, application Japan, Feb. 13, 1987, 62-30811
Int. Cl.[5] G09G 3/18
U.S. Cl. 340—805 9 Claims



1. An active matrix display device operative according to a video signal, comprising:

a group of column electrodes and another group of row electrodes which interesect with the column electrodes to define intersections therebetween;

a plurality of matrix picture elements disposed at the respective intersections, each matrix picture element including a nonlinear switching device having two terminals and liquid crystal connected in series to the nonlinear switching device between the corresponding column and row electrodes;

column drive means for applying to the group of the column electrodes a column drive signal having phase and amplitude determined according to the video signal; and

row drive means operative to sequentially select the row electrodes for applying to the selected row electrode a first row drive signal different from the column drive signal and effective to turn on the nonlinear switching device of a picture element on the selected row electrode to thereby drive the picture element according to the column drive signal and for applying to the non-selected row electrodes a second row drive signal having phase and amplitude the same as those of the column drive signal and effective to substantially avoid the application of voltage to picture elements on the non-selected row electrodes.

4,945,353

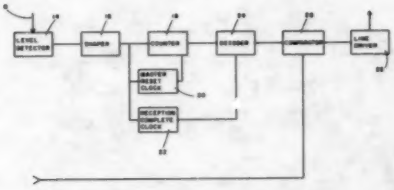
TELEMETRY SYSTEM USED WITH SENSING DEVICES

Raymond Jones, Marshfield, Mass., assignor to C&K Components, Inc., Newton, Mass.

Filed Nov. 17, 1988, Ser. No. 272,319

Int. Cl.[5] H04Q 9/00

U.S. Cl. 340—825.070 **3 Claims**



1. The combination of a power line and a transponder, the transponder comprising a level detector, a shaper, a counter, a master reset clock, a reception complete clock, a decoder, a line driver and a comparator, the line driver having a switch, the power line being connected to the level detector, which in turn being connected to the input of the shaper, the shaper being connected to the counter, the master reset clock and the reception complete clock, the master reset clock being connected to the counter and the reception complete clock being connected to the decoder and the switch being connected to the comparator, the shaper including an input and an output, the combination including a first resistor and a zener diode, first, second, third and fourth comparators, the first resistor and the zener diode connected in series to the base of a first transistor, the first transistor connected to a second resistor and being connected to the input of the shaper, the master reset clock having an input and an output, the output of the shaper electrically connected to the inputs of the first and second comparators, the third and fourth comparators including outputs, the fourth comparator being connected to the master reset clock and the reception complete clock, a first capacitor being connected to both the master reset clock and the reception complete clock.

4,945,354

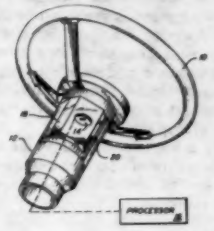
SPURIOUS SIGNAL CORRECTION FOR SURFACE ACOUSTIC WAVE (SAW) SECURITY DEVICES

James R. McColl, Concord, Mass., assignor to GTE Products, Danvers, Mass.

Filed Nov. 25, 1988, Ser. No. 276,072

Int. Cl.[5] G01S 13/74; G09C 1/00

U.S. Cl. 340—825.31 **10 Claims**



1. A security device that provides a coded surface acoustical wave which is converted to an electrical signal for comparison with a preset code, said security device comprising:

a substrate having means defining an acoustical wave path; and

a pattern of transducers disposed upon said substrate for providing said coded surface acoustical wave, including a plurality of spaced-apart tap transducers serially arranged along said acoustical path and operatively connected to a main transducer defining a given bit position in said code, and wherein a first of said serially arranged tap transducers closest to said main transducer is disposed a fractional bit length further from said main transducer than a given length of bits, each bit length defining a bit position in said code whereby crosstalk is reduced.

4,945,355

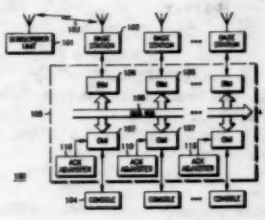
SYSTEM FOR COOPERATIVELY REASSIGNING DUTIES IN A MULTIPLE CONTROLLER ENVIRONMENT

Jeffrey J. Blanchette, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 27, 1988, Ser. No. 263,447

Int. Cl.[5] H04B 7/00; H04J 3/00

U.S. Cl. 340—825.060 **4 Claims**



1. In a communication system having a plurality of subscriber units, a plurality of base stations, a plurality of radio frequency communication channels, a plurality of consoles, a central electronics bank that consists of a plurality of base interface modules, a plurality of operator multiplex interface modules, and a data bus, wherein the central electronics bank, via the plurality of operator multiplex interface modules and the plurality of base interface modules, operably couples the plurality of radio frequency communication channels to the plurality of consoles, a method for cooperatively executing

and reassigning acknowledgement assignments comprising the steps of;

(a) receiving, by a base interface module of the plurality of base interface modules, a data message transmitted by a subscriber unit of the plurality of subscriber units to produce a received data message;

(b) generating, for the received data message, an acknowledgement signal by each of a predetermined number of operator multiplex interface modules of the plurality of operator multiplex interface modules to produce generated acknowledgement signals, where the predetermined number of operator multiplex interface modules have acknowledgement assignments for data messages received by the base interface module of step (a);

(c) transmitting, by the base interface module of step (a), one of the generated acknowledgement signals to the subscriber unit of step (a); and

(d) reassigning acknowledgement assignments for at least one of the plurality of operator multiplex interface modules whenever the central electronics bank detects a predetermined event.

4,945,356

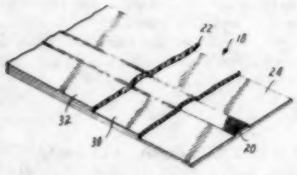
STRIP MATERIAL FOR AND A SURFACE MOUNTED INDUCTIVE LOOP

Martin C. Henderson, Los Angeles; Ralph J. Koerner, Ramona, and William D. Jordan, Jr., Los Angeles, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 9, 1983, Ser. No. 502,562

Int. Cl.[5] G08G *1/01*

U.S. Cl. 340—941 **23 Claims**



1. An inductive loop adapted to be applied to the surface of a roadway, comprising:

a loop of a ductile, flexible, extensible, flattened, metallic mesh; and

a protective covering adhered to said loop, said protective covering being capable of adhering said loop to said surface of said roadway.

4,945,357

JOYSTICK ASSEMBLY

Amir Tal, Natanya, Israel, assignor to Rotal Industries & Trading Ltd., Natanya, Israel

Continuation-in-part of Ser. No. 238,332, Aug. 29, 1988. This application Apr. 3, 1989, Ser. No. 331,825

Int. Cl.[5] H03M *11/00*

U.S. Cl. 341—20 **12 Claims**

1. A joystick assembly for use with a computer having a keyboard, the keyboard including at least four predeterminately positioned cursor control keys for controlling a cursor position on a display of the computer, the control keys being spaced about a central key, the joystick assembly being adapted for actuating a plurality of control keys by lateral movement of a handle thereof, the joystick assembly comprising:

a handle;

a multi-arm member having a plurality of circumferentially spaced arms extending in a common plane from a center aperture, each of said arms having an end which depends from its associated arm such that each arm forms a substantially L-shaped member extending from the center aperture, said aperture being sized to accept entry of the handle therethrough; and

means for pivotably attaching an end of sid handle to a central key of a keyboard whereby pivoting motion of

said handle causes selected ones of said depending ends of the multi-arm member to depress selected cursor control keys for controlling the position of a cursor on a computer display, said means for attaching being mounted to said central key of said keyboard.

4,945,358

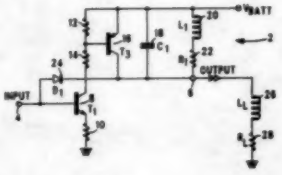
SHORT CIRCUIT PROTECTION ARRANGEMENT FOR A DRIVER CIRCUIT

Stanley Wrzesinski, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1989, Ser. No. 358,970

Int. Cl.[5] H02H *3/16*

U.S. Cl. 361—42 **9 Claims**



1. A short circuit protection arrangement for a driver circuit having an input, an output, and short circuit protection means for sensing the presence of a short circuit condition at the driver circuit output and disabling the driver circuit in response thereto and for sensing the discontinuance of the short circuit condition and re-enabling the driver circuit in response thereto, the short circuit protection means comprising:

means for establishing an inductive current at the output upon the occurrence of the short circuit condition; and means for sensing the increase in voltage at the output due to the inductive current upon discontinuance of the short circuit condition.

4,945,359

A/D CONVERTER

Kazuo Yamakido, Hinode, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1989, Ser. No. 326,743

Claims priority, application Japan, Mar. 25, 1988, 63-69447

Int. Cl.[5] H03M *1/12*

U.S. Cl. 341—143 **11 Claims**

1. An analog/digital converter comprising:

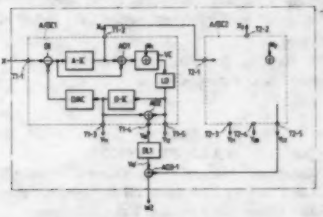
input means for producing a second analog signal on the

basis of an analog input signal and a first analog signal produced by digital/analog conversion means;

first integration means coupled to said input means for integrating said second analog signal to produce a third analog signal;

analog/digital conversion means coupled to said input means and said first integration means for producing a first digital signal on the basis of said second and third analog signals;

second integration means coupled to said analog/digital conversion means for integrating said digital signal to produce a second digital signal;



said digital/analog conversion means being coupled to said second integration means and said input means for producing said first analog signal on the basis of said second digital signal;

addition means coupled to said analog/digital conversion means and said second integration means for adding said first and second digital signals to produce a digital output signal;

a first output terminal connected to output said first digital signal;

a second output terminal connected to output a second digital signal; and

a third output terminal connected to output said digital output signals.

4,945,360

RADAR ALTIMETER

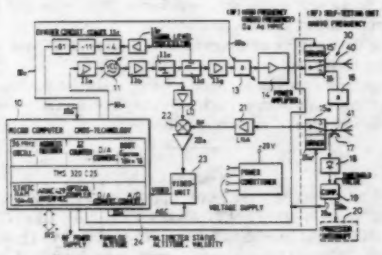
Guenther Trummer, Baiersdorf; Richard Koerber, Putzbrunn, and Ludwig Mehltretter, Riemerling, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1989, Ser. No. 406,295

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1988, 3830992

Int. Cl.[5] G01S *13/26*

U.S. Cl. 342—122 **11 Claims**



1. A radar altimeter operating, preferably in the C-Band, in accordance with the frequency modulated continuous wave (FMCW) principle, comprising receiver means for receiving reflected radar signals and transmitter means for transmitting radar signals, said transmitter means including voltage controlled oscillator means (11) for generating a carrier frequency, micro-computer means (10) for controlling the operation of said altimeter, closed loop control circuit means (11*f*, 10*a*, 10*b*) interconnecting said voltage controlled oscillator means (11) and said microcomputer means (10), a variable signal attenuating circuit (13) connected to an output of said voltage controlled oscillator, a power amplifier (14) connected to an output of said damping circuit (13), a self-testing mode control circuit (30) including a transmitter MMIC-switch (15) and a transmitter antenna means (40) connectable through said transmitter MMIC-switch (15) to an output of said power amplifier (14), said self-testing mode control circuit further including a receiver antenna (41) and a receiver MMIC-switch (15*a*) for connecting said receiver antenna to said receiver means, and decoupling means (17) operatively connected to said receiver antenna for decoupling a portion of received radio frequency power, detector means (18) connected to said decoupling means (17) for providing a d.c.-voltage signal representative of said received radio frequency power, signal comparing means connected to receive said d.c.-voltage signal for comparing said d.c.-voltage signal with a reference threshold signal, said microcomputer comprising interrupt circuit means (20) connected to an output of said signal comparing means for causing a processing interruption and a "waiting loop" in response to a signal at said output of said signal comparing means signifying an excessive received radio frequency power, and wherein all circuits of said altimeter are constructed in accordance with MMIC-techniques for a complete digital signal evaluation and mode control.

4,945,361

AUTOMOBILE ANTENNA ATTACHMENT DEVICE

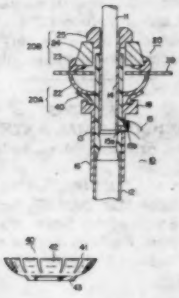
Yoshimi Egashira, Sagamihara, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1989, Ser. No. 353,445

Claims priority, application Japan, Jul. 15, 1988, 63-93761

Int. Cl.[5] H01Q *1/32*

U.S. Cl. 343—715 **4 Claims**



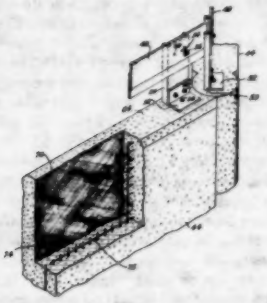
1. A device for attaching an antenna to an automobile, said device comprising an inner fastening element including a gland washer formed of an elastic and electrically conductive material and a gland base, and an outer fastening element including a pad and fastening means, said antenna being fastened to an automobile body wall by clamping said automobile body wall with said fastening elements, and the clamping force of said fastening elements being maintained by elastic deformation of said elastic material so as to compensate for decreases in the contact pressure between said inner and outer fastening elements and between said fastening elements and said automobile body wall which is caused by permanent deformation of said pad and wherein said gland washer is of a saucer shape with a plurality of radial cut-outs provided in the periphery thereof to form a plurality of tongues in a pedal-like arrangement.

4,945,362

MICROWAVE SHIELDING FOR SATELLITE EARTH STATIONS

Bernhard E. Keiser, Vienna, Va., assignor to The Reinforced Earth Company, Arlington, Va.

Filed Mar. 20, 1985, Ser. No. 714,093
Int. Cl.[5] H01Q *15/14*
U.S. Cl. 343—841 **3 Claims**



3. A construction for shielding an antenna for a satellite earth station against interfering microwave radio frequency radiation, comprising, in combination:

a concrete wall structure having a top and interposed between the source of interfering microwave radiation and the antenna, the wall structure having an electrically conductive, perforated metallic screen cast within the wall, screening the area defined by the wall's surface from RF radiation and substantially reflecting microwave radiation; and

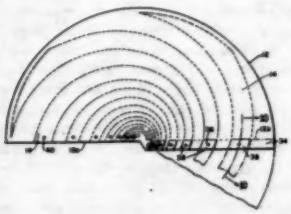
an adjustable RF diffractor made of conductive material and having one or more thin horizontal openings near the structure's top to create destructive interference with the diffractor positioned at the top of the wall structure along at least a portion of the wall structure, whereby undesirable microwave radiation is substantially reflected by the wall structure and diffraction across the top of the wall is adjustably controlled in the vicinity of the antenna by varying the opening width and location on the structure.

4,945,363

CONICAL SPIRAL ANTENNA

Robert W. Hoffman, Arlington, Mass., assignor to Revlon, Inc., New York, N.Y.

Division of Ser. No. 613,911, May 25, 1984, Pat. No. 4,675,690. This application Mar. 20, 1987, Ser. No. 28,400
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[5] H01Q *1/36*
U.S. Cl. 343—895 **5 Claims**



1. A conical spiral antenna, comprising

a cone having a seam along a straight line, formed from a flat flexible substrate having generally the shape of a circular sector bounded by radial edges carrying a plurality of spaced conductive segments by joining the radial edges of said flat flexible substrate, the plurality of spaced conductive segments on the flat flexible substrate forming a plurality of ribbon-like spiral conductors on the cone,

means for joining said radial edges to form the seam of the cone,

means for electrically interconnecting mating portions of the ribbon-like spiral conductors across said seam,

said means for joining said radial edges of the flat flexible substrate to form the cone with said seam including a flange on one of the radial edges of said substrate arranged to overlap a surface immediately adjacent to the other radial edge of said substrate when said radial edges are joined, and

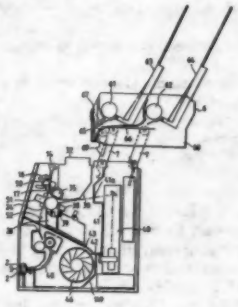
means for riveting the mating portions of the ribbon-like spiral conductors on said cone.

4,945,364

PAGE PRINTER

Mitsuaki Maruyama; Hiroshi Niki; Shigeru Sawada; Seiji Mochizuki, and Yasuhiro Gyoutoku, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 6, 1989, Ser. No. 403,309
Claims priority, application Japan, Sep. 7, 1988, 63-224076; Sep. 7, 1988, 63-224077
Int. Cl.[5] G01D *15/00*
U.S. Cl. 346—160 **5 Claims**



1. A page printer comprising:

a housing including a housing body and a cover pivotally coupled to a lower end of said housing body;

a gate roller, a developing unit, a photo-sensitive drum unit, a fixing unit and a sheet discharge roller arranged on a front side of said housing body;

an optical writing unit provided on a rear side of said housing body; and

guide means provided on said housing body, for guiding said photo-sensitive drum unit obliquely downwardly toward the rear side of said housing body.

4,945,365

CAMERA CAPABLE OF INPUTTING AND OUTPUTTING SIGNALS BETWEEN IT AND EXTERNAL DEIVCE THROUGH FILM SENSITIVITY READING MATERIALS

Akihiko Fujino, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

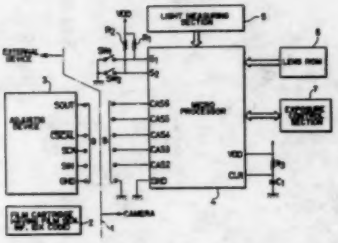
Filed May 11, 1989, Ser. No. 350,229
Claims priority, application Japan, May 16, 1988, 63-118627
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—21 **4 Claims**

1. A camera which input and outputs signals between the

camera and an external device through a plurality of film sensitivity reading terminals, said camera including;

film sensitivity reading means connected to said film sensitivity reading terminals,

signal input and output means connected to at least one of said reading terminals for the input and output of signals between said reading terminals and the external device; and



control means which activates said signal input and output means only when the camera is judged to be not loaded with a film cartridge having film sensitivity information responsive to an analysis of signals transmitted through said reading terminals and read by said film sensitivity reading means.

4,945,366

ENDOSCOPE STILL PHOTOGRAPHING APPARATUS PROVIDED WITH AN AUTOMATIC ILLUMINATING LIGHT AMOUNT CONTROLLING FUNCTION

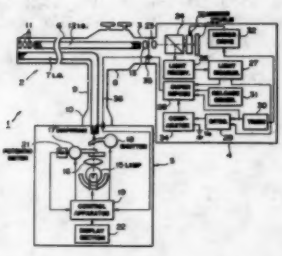
Yasushi Hisamichi, Hachioji, and Akihiko Miyazaki, Nagoya, both of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,417

Claims priority, application Japan, Sep. 21, 1988, 63-237184

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—62 **7 Claims**



1. An endoscope still photographing apparatus comprising:

an endoscope comprising an elongate insertable part, a light guide inserted through said insertable part, transmitting an illuminating light and emitting it from the end surface on the tip part side, an objective optical system arranged in the tip part of said insertable part and forming an object image and an image guide transmitting the optical image formed by said objective optical system to the end surface on the eyepiece part side;

an endoscope still camera comprising an image forming lens fittable to said eyepiece part and forming the optical image transmitted by said image guide, a recording medium arranged in the focal plane of said image forming lens, a light receiving device receiving a part of the light amount passed through said image forming lens, a light measuring means outputting a light measuring signal corresponding to the light amount reaching said recording medium side from the signal photoelectrically converted by said light receiving device, an integrating means integrating said light measuring signal, a judging means judging whether the output level of said integrating means has reached the first reference level corresponding to the optimum exposure amount of said recording medium, a release signal generating means outputting a release indicating signal exposing said recording medium and a timer means triggered by said release indicating signal and operating said integrating means after a fixed time;

a lamp feeding the illuminating light to the other end surface of said light guide, a diaphragm formed of an illuminating light amount varying member which can vary the passed light amount of the light of said lamp, a diaphragm diving means driving said diaphragm, a diaphragm position signal generating means outputting a signal of the level corresponding to the position of said diaphragm driven by said diaphragm driving means, a shutter intercepting the illuminating light fed to said light guide, a diaphragmed amount controlling means started by said release indicating signal and controlling to drive said diaphragm so that the level of said light measuring signal transmitted by a signal cable within said endoscope may coincide with the second reference level corresponding to the optimum illumination intensity, a holding means holding said diaphragm position signal by said diaphragmed amount controlling means and an exposure amount controlling means holding the diaphragm position signal by said holding means, then exposing said recording medium with the output of said timer means and controlling to close said shutter at the timing when the signal level on which said light measuring signal is integrated by said integrating means has reached said first reference level.

4,945,367

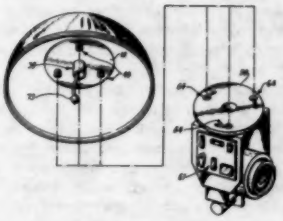
SURVEILLANCE CAMERA SYSTEM

David M. Blackshear, Rte. 1, Box 175, Molena, Ga. 30258

Continuation-in-part of Ser. No. 163,257, Mar. 2, 1988, Pat. No. 4,918,473. This application Aug. 9, 1989, Ser. No. 391,173

Int. Cl.[5] G03B *29/00*; H01N *7/18*

U.S. Cl. 354—81 **7 Claims**



1. A surveillance camera system comprising:

a housing;

a camera mount including a camera receiving platform mounted for panning movement about a pan axis and tilting movement about a tilt axis;

means for releasably mounting said camera mount within said housing with said means comprising a first mounting plate positioned within and secured to said housing and a second mounting plate secured to said camera mount;

said first mounting plate including a set of depending pins having heads and said second mounting plate including a set of corresponding slots configured and positioned to receive and lockingly engage with said pins upon juxtapo-

sition and rotation of said first mounting plate relative to said second mounting plate;

electric motor means on said camera mount for panning said camera receiving platform about said pan axis and tilting said camera receiving platform about said tilt axis;

orientation control means mounted within said housing for selectively actuating said electric motor means to control panning and tilting movement of said camera receiving platform;

remote control means for controlling said orientation control means from a location remote from said surveillance camera system; and

rotary electric coupling means mounted within said housing with said coupling means including electric connector means for operatively connecting said orientation control means with said remote control means and for electrically connecting a camera secured to said camera receiving platform with an ancillary video display.

4,945,368

CAMERA WITH BUILT-IN ELECTRONIC FLASH

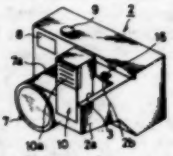
Tokio Ishino, Kawasaki; Atsushi Sato, Tokorozawa, and Motokuni Demura, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,454

Claims priority, application Japan, Sep. 10, 1988, 63-118343[U]

Int. Cl.[5] G03B *15/03*

U.S. Cl. 354—149.11 **6 Claims**



1. A camera comprising:

a camera body which is integrally formed with a lens barrel containing a lens having an optical axis, and which defines a receiving chamber extending along a lateral side of the lens barrel in parallel to the optical axis of the lens, the receiving chamber having front and rear end portions and being open forward and upward at the front end portion thereof; and

an elongated electronic flash body having top and bottom ends and provided at its one side with a light emitting window located near a top end thereof, the flash body being built into the camera body through a pop-up means so as to be moved between a first position at which substantially the overall length of the flash body is received into the receiving chamber in a state that the light emitting window is oriented downward and that the bottom end of the flash body is located in the rear end portion of the receiving chamber, and a second position at which the flash body is raised upward from the camera body in a state that the light emitting window is oriented forward and that the bottom end of the flash body is located in the front end portion of the receiving chamber.

4,945,369

FILM MAGAZINE FOR UNDERWATER CAMERAS

John H. Florda, 3074 Van Buren Ave., Costa Mesa, Calif. 92626

Filed Aug. 2, 1989, Ser. No. 389,253

Int. Cl.[5] G03B *1/12, 1/66, 13/02, 17/26*

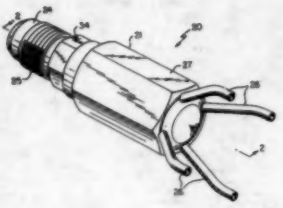
U.S. Cl. 354—173.1 **7 Claims**

1. For use in combination with a camera having means for exposing film and film transport means for advancing film between exposures, a film magazine comprising:

an outer housing having attachment means for attachment to the camera and sealing means for forming a seal therewith;

a film housing configured to be received within said outer housing and defining first and second of cavities;

first and second film cannisters supported within said first and second cavities respectively;



motor drive means coupled to said second film cannister for causing rotation thereof such that a quantity of film may be wound upon said first cannister and transferred to said second cannister through the film transport means of the camera; and

sensing means coupled to said motor drive means for detecting the advance of the film and operating said motor drive means to transfer a portion of the film to said second cannister.

4,945,370

FILM REWINDING SYSTEM OF CAMERA

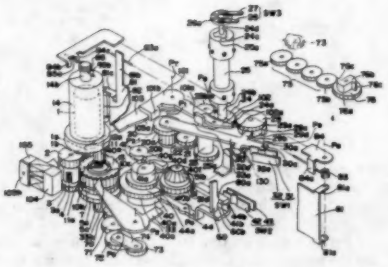
Takahisa Saimada; Hideo Kajita; Sueyoshi Okumura; Reiji Seki; Toshihiko Ishimura, and Sinji Katayori, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1989, Ser. No. 333,700

Claims priority, application Japan, Apr. 6, 1988, 63-86161; Apr. 6, 1988, 63-86162; Apr. 7, 1988, 63-87650; Apr. 8, 1988, 63-87558; May 11, 1988, 63-115404; Jun. 21, 1988, 63-154333; Jun. 21, 1988, 63-154334; Jun. 21, 1988, 63-154335; Jun. 21, 1988, 63-154336; Jun. 21, 1988, 63-154337; Aug. 17, 1988, 63-204282; Aug. 17, 1988, 63-204283

Int. Cl.[5] G03B *1/12*

U.S. Cl. 354—173.11 **7 Claims**



1. A film-rewinding system of a camera, capable of automatically rewinding a film roll, comprising:

driver means having a first driving characteristic representing driving at a high rotational speed with low torque and a second driving characteristic representing driving at a low rotational speed with high torque;

switching-over means for switching over the driving charac-

teristics of said driver means one to the other and vice versa;

time setting means for setting a first time at the time when said driver means is switched over to the first driving characteristic and for setting a second time at the time when said driver means is switched over to the second driving characteristic, the second time being longer than the first time;

film rewinding means driven by said driver means for rewinding the film roll;

first detection means for detecting completion of film rewinding; and

means for making said driver means turned off when the time set by said time setting means is up after the completion of the film rewinding is detected.

4,945,371

DEVICE FOR CONTROLLING A ZOOM LENS OF A CAMERA

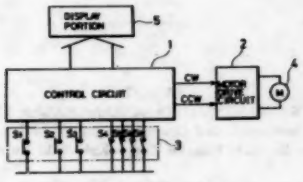
Takeshi Hashimoto, and Keisuke Maeda, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 28, 1989, Ser. No. 399,592

Claims priority, application Japan, Aug. 29, 1988, 63-215928

Int. Cl.[5] G03B *3/10*

U.S. Cl. 354—195.13 **19 Claims**



16. A device for controlling a zoom lens of a camera comprising:

drive means for driving a zoom lens;

control means for controlling the drive means so as to drive the zoom lens to one of a plurality of stop positions; and

display means for indicating the pluralitY of stop positions.

4,945,372

CAMERA

Tatsuji Higuchi, Akigawa; Kazuo Yamamoto, Yokohama; Hitoshi Shirai, Sagamihara; Yasuo Yamazaki, Hino; Yuichi Torikoshi, Shiroyama; Kazuyuki Iwasa, and Toshifumi Nakano, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 307,367

Claims priority, application Japan, Feb. 16, 1988, 63-33028; Feb. 16, 1988, 63-33029

Int. Cl.[5] G03B *3/00*

U.S. Cl. 354—199 **14 Claims**

1. A camera, comprising:

a photographic optical system movable along an optical axis;

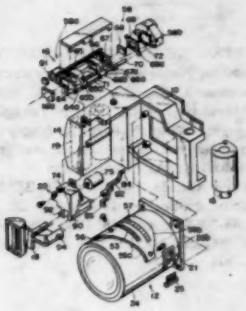
a cam ring rotatable about the optical axis of the photographic optical system, for moving the photographic optical system along the optical axis thereof to change the focal length of the photographic optical system by rotation, said cam ring including a cylindrical body, and an interlocking member fixed to the outer peripheral surface of the body and having an engaging portion;

drive means engaged with said engaging portion of the interlocking member, for rotating the cam ring;

a viewfinder optical system arranged outside of the cam ring, in relation to the radial direction thereof, and having an optical axis parallel to that of the photographic optical system;

a strobe mechanism arranged outside of the cam ring, in relation to the radial direction thereof, for movement parallel to the optical axis of the photographic optical system;

first cam means formed on the interlocking member, for moving the viewfinder optical system along the optical axis thereof, in association with the rotation of the cam ring, said first cam means having a working surface engaging the viewfinder optical system and changing its configuration in the direction of the optical axis of the photographic optical system; and



second cam means formed on the interlocking member, for moving the strobe mechanism in a direction parallel to the optical axis of the photographic optical system, in association with the rotation of the cam ring, said second cam means having a working surface engaging the strobe mechanism and changing its configuration in the direction of the optical axis of the photographic optical system.

4,945,373

DISPLAY SYSTEM FOR CAMERA

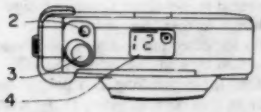
Takeshi Hashimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 18, 1989, Ser. No. 298,112

Claims priority, application Japan, Jan. 19, 1988, 63-4195[U]

Int. Cl.[5] G03B *17/18, 17/36*

U.S. Cl. 354—217 **8 Claims**



1. A display system for a camera, comprising:

a display means for displaying at least two figures thereon;

a first display control means for controlling said display means to display a frame count of a film;

a taking lens having a variable focal length;

a detecting means for detecting a focal length of said taking lens;

a second display control means for controlling said display means to display the focal length of said taking lens detected by said detecting means;

a changing means for alternatively rendering said first display control means or said second display control means effective;

an operating means;

a lens driving means for driving said taking lens to vary a focal length of said taking lens in response to operation of said operating means, wherein said changing means renders said second display control means effective in place

of said first display control means in response to operation of said operating means; and

a timer means for counting a predetermined period of time in response to stopping of said operation of said operating means to output a signal for the predetermined period of time, wherein said changing means renders said second display control means effective in place of said first display control means in response to the signal of said timer means.

4,945,374

PRESSURE DEVELOPING DEVICE

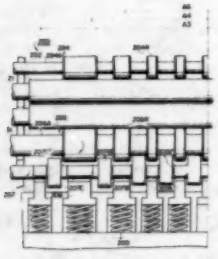
Takemi Yamamoto, Nagoya; Hiroshi Kawahara, Nishikasugai; Yumio Matsumoto, Kasugai; Shigeyuki Hayashi, Nagoya; Kiyoharu Hayakawa, Ama; Osamu Takagi, Nagoya; Yuji Asano, Nagoya; Takao Nakazawa, Nagoya, and Shunichi Higashiyama, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 28, 1989, Ser. No. 339,803

Claims priority, application Japan, Apr. 20, 1988, 63-97813; Aug. 9, 1988, 63-206876; Aug. 19, 1988, 63-206876

Int. Cl.[5] G03B *27/52*; B30B *3/04*; G03C *5/02*

U.S. Cl. 354—304 **10 Claims**



1. A pressure developing device having a pair of pressure rollers being adapted to be brought into and out of contact with each other for pressurizing an exposed recording sheet containing a plurality of photo-sensitive microcapsules each containing a component to change the rupture strength thereof when exposed to light and a developing sheet coated with a developer material to develope a visible image, said pressure developing device further comprising:

detect means for detecting width of the developing sheet to be pressurized by said pair of rollers; and

control means for controlling said pair of rollers so as to pressurize an area corresponding to the width detected by said detect means of the recording sheet and the developing sheet with a predetermined pressure force while pressurize the other area with pressure force less than said predetermined pressure force.

4,945,375

PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS

Takashi Nakamura, Minami-ashigara, and Yasuhisa Ogawa, Hatano, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1989, Ser. No. 340,819

Claims priority, application Japan, Apr. 20, 1988, 63-97783; Mar. 17, 1989, 1-65382

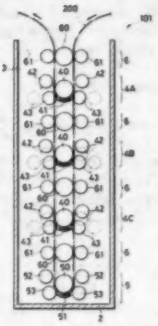
Int. Cl.[5] G03D *3/02, 3/08*

U.S. Cl. 354—322 **12 Claims**

1. A photosensitive material processing apparatus comprising:

a tank containing processing liquid therein; and

means for passing photosensitive material through said liquid along a path having a variable length



and having a plurality of vertically spaced-apart feed means which provide selectable reverse points, wherein said means for passing varies a length of said path by selecting a particular reverse point.

4,945,376

CAMERA HAVING INTERCHANGEABLE LENSES

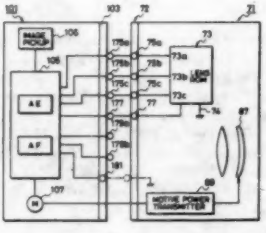
Masahiro Kawasaki, and Osamu Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 266,328, Nov. 1, 1988, Pat. No. 4,841,322, which is a continuation of Ser. No. 103,311, Oct. 1, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 341,176

Claims priority, application Japan, Oct. 1, 1986, 61-234141; Nov. 10, 1986, 61-265738; Nov. 6, 1987, 62-15509[U]

Int. Cl.[5] G03B *3/10*

U.S. Cl. 354—400 **13 Claims**



5. A photographing lens comprising:

a lens system including an automatically focusing movable lens;

a lens mount having a mount surface;

memory means;

a plurality of electrical contacts provided on the mount surface of said lens mount and connected to respective data terminals of said memory means; and

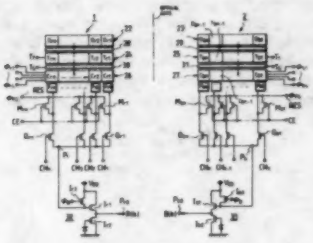
a first electrical contact provided on and projecting from the mount surface of said lens mount, to which electric power is supplied from a camera body to drive said memory means if said camera body is of an automatic focusing type.

4,945,377

PHASE DIFFERENCE DETECTING APPARATUS

Takashi Milda, and Nozomu Ozaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 7, 1988, Ser. No. 216,360
Claims priority, application Japan, Jul. 8, 1987, 62-168895
Int. Cl.[5] G03B 13/00
U.S. Cl. 354—402 **4 Claims**



1. A phase difference detecting apparatus for detecting a relative distance between a pair of focused images obtained from subject luminous flux passed through an objective lens to thereby judge a focusing state of said objective lens, comprising:

(a) a first signal generating means including,

1. a first light receiving section constituted by picture elements arranged in a row so as to receive a first one of said focused images,
2. a first signal reading-out section for transferring, in a predetermined direction, signals generated in said respective picture elements of said first light receiving section and at the same time outputting said signals in parallel, with respect to each other, through floating gates of a first CCD, and
3. means for converting said signals output in parallel from said floating gates of said first CCD into a first time series signal and outputting said first time series signal;

(b) a second signal generating means including,

1. a second light receiving section constituted by picture elements arranged in a row to receive a second one of said focused images,
2. a second signal reading-out section for transferring, in a predetermined direction, signals generated in said respective picture elements of said second light receiving section and at the same time outputting said signals in parallel, with respect to each other, through floating gates of a second CCD, and
3. means for converting said signals output in parallel from said floating gates of said second CCD into a second time series signal which has a predetermined quantity of relative movement relative to said first time series signal and outputting said second time series signal;

(c) a switching-capacitor integrator means including a plurality of capacitive elements and switching elements for intermittently connecting said capacitive elements to each other, and for receiving said first and second time series signals;

(d) gain control means for controlling a gain of said switching-capacitor integrator means by changing capacitance of said plurality of capacitive elements; and

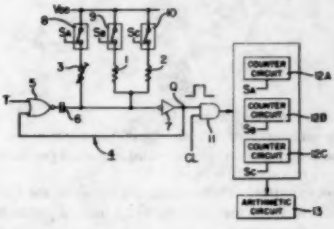
(e) control means for comparing sizes of said first and second time series signals with each other to thereby generate a control signal corresponding to a relation of size between said first and second time series signals, and controlling said switching elements on the basis of said control signal to cause said switching-capacitor integrator means to generate an electric charge corresponding to an integrated value of an absolute value of a difference between said first and second time series signals and to cause said switching-capacitor integrator means to generate, as a correlative value, an integrated value on the basis of said first and second time series signals in predetermined numbers whenever said quantity of relative movement is changed in order to provide a signal indicative of a phase difference between said first and second time series signals.

4,945,378

CIRCUIT FOR DETECTING BACK LIGHT

Shinji Nagaoka; Yoichi Seki; Hiroyuki Saito, and Michio Taniwaki, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Dec. 27, 1988, Ser. No. 290,451
Claims priority, application Japan, Dec. 29, 1987, 62-336678
Int. Cl.[5] G03B 7/08
U.S. Cl. 354—429 **6 Claims**



1. A circuit for detecting back light, comprising:

a time constant determining device comprising a first photoconductive device for outputting a first signal representative of a first resistance value proportional to the brightness of the surrounding portion of an object to be photographed, a second photoconductive device for outputting a second signal representative of a second resistance value proportional to the brightness of the central portion of the object, and a reference resistive element for use in outputting a reference signal representative of a reference resistance value;

a time constant circuit selectively receptive of the first, second and reference signals for determining a time constant and for producing a corresponding output signal;

switching circuit means for selectively connecting said time constant determining device to said time constant circuit;

a pulse-generating circuit for receiving the output signal from the time constant circuit and producing pulses the number of which corresponds to the resistance value of said time constant determining device connected by the switching means;

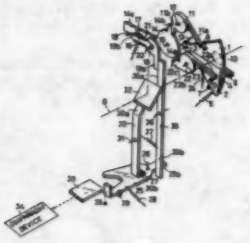
a counter circuit for counting the number of pulses delivered from the pulse-generating circuit; and

an arithmetic circuit for comparing the magnitude of the ratio of the total count obtained by the counter circuit when the first photoconductive device is connected to said time constant circuit to the total count obtained when the reference resistive element is connected to said time constant circuit, with the magnitude of the ratio of the total count obtained when the second photoconductive device is connected to said time constant circuit to the total count obtained when the reference resistive element is connected to said time constant circuit.

4,945,379
CAMERA SHUTTER AND VIEWFINDER CONTROL APPARATUS

Nobuaki Date; Akio Sunouchi, both of Kawasaki; Syuichiro Saito, Yokohama; Yoshitaka Murata, Yokohama; Yukio Ogawa, Yokohama, and Nobuo Tezuka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 945,948, Dec. 24, 1986, abandoned.
This application Aug. 7, 1989, Ser. No. 391,716
Claims priority, application Japan, Dec. 28, 1985, 60-297472; Dec. 28, 1985, 60-297473; Dec. 28, 1985, 60-297474; Dec. 28, 1985, 60-297475; Dec. 28, 1985, 60-297476; Dec. 28, 1985, 60-297477; Dec. 28, 1985, 60-297478
Int. Cl.[5] G03B *9/10, 19/12*
U.S. Cl. 354—441 21 Claims



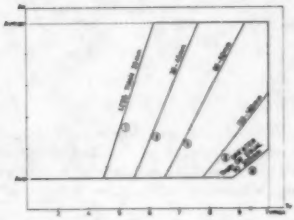
1. A camera comprising:
a first shutter member movable between a rest position where it closes an aperture and a moved position where it opens the aperture;
a second shutter member movable between the rest position where it opens the aperture and a moved position where it closes the aperture;
latch means for latching said first shutter member at its moved position;
unlatch means responsive to movement of said second shutter member to its moved position to release said latch means;
a viewfinder mirror; and
means for moving said mirror between a viewing position in an optical path and a retracted position out of the optical path;
said latch means being responsive to said moving means to latch said first shutter member at its moved position when said mirror is moved to the retracted position by said moving means.

4,945,380
PROGRAM EXPOSURE CALCULATING APPARATUS

Takehiro Katoh; Shinichi Nishimura, and Toshihiko Ishimura, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1988, Ser. No. 270,017
Claims priority, application Japan, Nov. 13, 1987, 62-287800
Int. Cl.[5] G03B *7/08*
U.S. Cl. 354—443 21 Claims

1. A program exposure calculating apparatus comprising:
focal length outputting means for outputting information in association with a focal length of a lens;
full open aperture value outputting means for outputting information indicating a full open aperture value of said lens;
restricting exposure time outputting means for outputting information indicating restricting exposure time which becomes shorter as the focal length becomes longer, in response to the information in association with the focal length;
program constant outputting means for outputting, in response to the information in association with the focal length, a program constant which makes a ratio of an amount of change of the aperture value to an amount of change of the time value larger as the focal length becomes shorter;
exposure value outputting means for outputting information indicating an exposure value;
reference exposure value calculating means for calculating a reference exposure value based on the information indicating the restricting exposure time outputting from said restricting exposure time outputting means and the information indicating the full open aperture value outputted from said full open aperture value outputting means;
comparing means for comparing the exposure value outputted from said exposure value outputting means with the

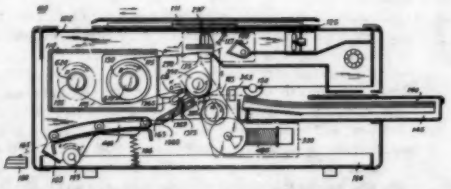


reference exposure value outputted from said reference exposure value calculating means; and
setting means for setting the full open aperture value outputted from said full open aperture value outputted means as the aperture value and setting the exposure time as the exposure time appropriate for the full open aperture when it is determined that said exposure value is smaller than said reference exposure value by said comparing means; and for setting an aperture value and an exposure time capable of providing appropriate exposure based on said exposure value, said restricting exposure time outputted from said restricting exposure time outputting means, and the program constant outputted from said program constant outputting means when it is determined that said exposure value is larger than said reference exposure value by said comparing means.

4,945,381
IMAGE FORMING APPARATUS

Kiyohiro Yamagata; Nobumasa Abe; Koichi Toba; Atsushi Kobayashi, and Koji Watanabe, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,148
Claims priority, application Japan, Oct. 7, 1986, 61-238273; Oct. 17, 1986, 61-246691; Dec. 2, 1986, 61-287466; Apr. 24, 1987, 62-101194; May 19, 1987, 62-121727; May 27, 1987, 62-130424; Jun. 16, 1987, 62-149681
Int. Cl.[5] G03B *27/32, 27/52*
U.S. Cl. 355—27 47 Claims



1. An image forming apparatus using pressure receiving materials, said pressure receiving materials including a receiving medium and a photosensitive medium having microcap-

sules on a front surface thereof, each microcapsule containing at least an optically hardening or softening matter and a color former; the photosensitive medium being first superposed on the receiving medium after exposing the photosensitive medium to light representative of the image to be formed, and being then pressed against the receiving medium for development of the image on the receiving medium, the apparatus comprising:

a photosensitive medium container for storing said photosensitive medium having an open-ended top;

exposing means for exposing said photosensitive medium to light representative of the image;

a receiving medium container for storing said receiving medium;

pressure developer means for applying pressure to said pressure receiving materials for development of the image on the receiving medium; and

an external drive shaft; and

wherein said photosensitive medium container includes a supply shaft around which the unexposed portion of said photosensitive medium is wound and which communicates with the external drive shaft; a member for rotatably supporting said supply shaft and for preventing exposure to light of the unexposed portion of the photosensitive medium; and a storage shaft around which the exposed portion of said photosensitive medium is wound and which communicates with the external drive shaft, said container serving as a replaceable cassette for rotatably supporting said storage shaft and wherein said member and said storage shaft are insertably received by said container through said open-ended top.

4,945,382

A PRINTER FOR PRINTING A CERTAIN IMAGE ON A SHEET OF DEVELOPING PAPER

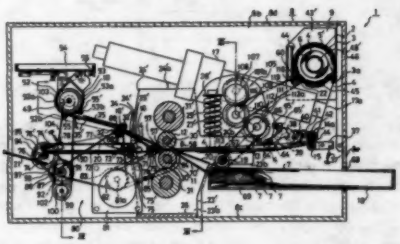
Yasuji Yui, Saitama; Akio Hitachi, Tokyo; Tatsuru Sato, Chiba, and Akira Shirakura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,954

Claims priority, application Japan, Jun. 5, 1987, 62-140912

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—27 **7 Claims**



1. An apparatus for printing an image on a sheet of developing paper from a relatively long film having a photosensitive surface composed of photosensitive microcapsules by exposing the photosensitive surface to a light image according to a corresponding picture signal to form a photographed film frame on a respective area of said sensitive surface, overlapping the exposed area of said sensitive surface and a sheet of the developing paper, and pressing together the overlapping areas of said sensitive surface of the film and said sheet of developing paper, the apparatus comprising:

a supply spool on which the film is wound;

a take-up spool on which the film withdrawn from said supply spool is wound;

press rollers urged toward each other and defining a nip therebetween through which said film passes intermediate said supply and take-up spools;

exposing means for selectively exposing to light the photosensitive surface of said film at a position intermediate said supply spool and said nip of the press rollers;

developing paper supplying means including a supply tray for holding a stack of sheets of said developing paper, and paper supply roller means operative to deliver said sheets one at a time from said stack to said nip between said press rollers for passage therebetween with each delivered sheet facing said sensitive surface of the film and being overlapped with a respective exposed area thereof so as to be pressed together therewith in said passage between said press rollers;

means for separating each said sheet of developing paper from said film after passage therewith between said press rollers; and

roller drive means having a printing mode and a rewinding mode and including a first reversible motor operative in first and second directions in said printing and rewinding modes, respectively, first transmission means driven by said first motor and including first one-way clutch means through which said first motor drives said paper supply roller means only when said first motor operates in said first direction in said printing mode, second transmission means driven by said first motor and including second one-way clutch means through which said supply spool is rotated in a direction to rewind said film thereon only when said first motor operates in said second direction in said rewinding mode, and a second reversible motor operative in first and second directions for driving said press rollers in corresponding first and second directions in said printing and rewinding modes, respectively.

4,945,383

IMAGE FORMING APPARATUS

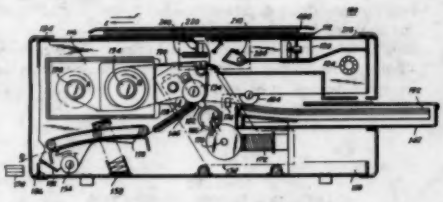
Atsushi Kobayashi; Takashi Suzuki, and Yasuhiko Kosugi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 149,815, Jan. 29, 1988, Pat. No. 4,860,058. This application Jun. 26, 1989, Ser. No. 370,969

Claims priority, application Japan, Feb. 2, 1987, 62-22006; Mar. 3, 1987, 62-48275; Apr. 30, 1987, 62-107702

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—30 **33 Claims**



1. An image forming apparatus for forming an image on a transfer medium by pressing the transfer medium against a photosensitive medium having light sensitive microcapsules thereon, the apparatus comprising:

an illuminating mechanism for illuminating said photosensitive medium;

exposure means for subjecting a first predetermined region of the photosensitive medium to light representative of the image and a second predetermined region of the photosensitive medium to light nonrepresentative of the image prior to pressing the transfer medium against the photosensitive medium; and

temperature control means for maintaining the ambient temperature surrounding at least the first predetermined region and the second predetermined region of the photosensitive medium within a predetermined range to prevent

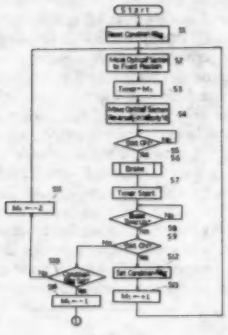
the ambient temperature from adversely affecting the light sensitive microcapsules in the first and second predetermined regions.

4,945,384

SCANNING-MEMBER-STOP POSITIONING DEVICE FOR THE IMAGE FORMING APPARATUS

Syuji Yamada, Hyogo, and Hironori Andou, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 28, 1989, Ser. No. 317,193
Claims priority, application Japan, Mar. 1, 1988, 63-49114
Int. Cl.[5] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **3 Claims**



1. A scanning-member-stop positioning device for an image forming apparatus, wherein a document in contact with a document glass plate is exposed due to the movement of a scanning member consisting of an optical section or a document glass plate, said device comprising:

means for driving a scanning member to run back toward a home position at a fixed velocity;

means for applying braking power to the scanning member under return beginning to be braked at the timing of passage over a fixed position;

means for changing a degree of braking power by said means for applying braking power; and

means for selecting a suitable degree of braking power based on the moving distances of the scanning member from the changed degrees of braking power.

4,945,385

IMAGE FORMING APPARATUS

Akiyoshi Kimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,863
Claims priority, application Japan, Sep. 11, 1987, 62-227667
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—202 **18 Claims**

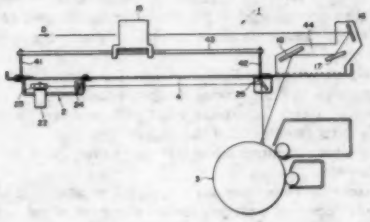
1. An apparatus, comprising:

a photosensitive member;

first optical means for illuminating an original and exposing said photosensitive member to light from the original, said first optical means including a lens unit having a lens for forming an image of the original on said photosensitive member; and

a second optical means for projecting light on said photosensitive member;

wherein said lens unit and said second optical means are fixed on the same base member, and wherein said lens unit is fixed on a top surface of said base member, and said



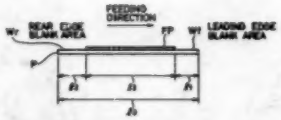
second optical means is fixed on a bottom surface of said base member.

4,945,386

COPIER WITH MAGNIFICATION SELECTION AND PAPER WINDING PREVENTION

Masazumi Ito, and Yoshihiro Horie, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 14, 1989, Ser. No. 323,627
Claims priority, application Japan, Mar. 16, 1988, 63-63804
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—243 **7 Claims**



1. A copying apparatus having a photoreceptor, image forming means for forming a toner image on said photoreceptor, transfer means including a transfer portion for transferring the toner image formed on said photoreceptor onto copy paper, fixing means for thermally fixing the toner image transferred on the copy paper, and duplex means for feeding again the thermally fixed copy paper to said transfer portion to form images on both surfaces of the copy paper, comprising:

mode selecting means for selecting

a duplex mode for forming images on both surfaces of copy paper, and

a simplex mode for forming an image on one surface of copy paper,

first means for forming a margin at a leading edge of the copy paper,

second means for forming margins at leading and rear edges of the copy paper, and

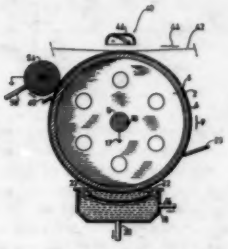
control means for enabling said first means in response to the selection of said simplex mode by said mode selecting means and enabling said second means in response to the selection of said duplex mode by said mode selecting means.

4,945,387

IMAGE TRANSFER APPARATUS AND METHOD USING TENSION TRANSFER MEMBER

Benzion Landa, Edmonton, Canada; Shabtai Ezuz, Moshav Beit Hanaan, Israel; Aron Shmaiser, Rishon-Le-Zion, Israel; Hanna Pinhas, Holon, Israel, and Ishaiau Lior, Nes Ziona, Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands

Filed Nov. 10, 1988, Ser. No. 269,710
Claims priority, application United Kingdom, Oct. 4, 1988, 8823259
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—271 52 Claims



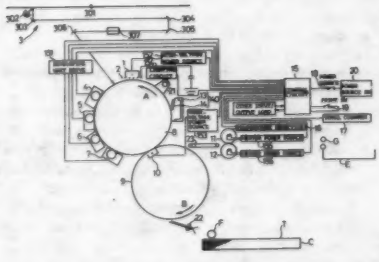
1. Imaging apparatus comprising:
an image bearing surface for receiving an image comprising charged toner particles;
a flexible substrate;
means for tensioning said flexible substrate in at least two directions;
means for bringing the tensioned flexible substrate into image transfer engagement with the image bearing surface; and
means for generating an electric field in a region where image transfer engagement occurs to facilitate transfer of the image on said image bearing surface to said flexible substrate.

4,945,388

METHOD AND APPARATUS FOR CLEANING A COLOR IMAGE FORMING APPARATUS BY STICKING DEVELOPER ON THE PHOTOCONDUCTOR WITHOUT FORMING AN IMAGE

Keigo Tange; Tomohisa Kanada, and Shingo Hirota, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1989, Ser. No. 409,302
Claims priority, application Japan, Sep. 20, 1988, 63-237140
Int. Cl.[5] G03G *21/00, 15/01*
U.S. Cl. 355—296 29 Claims



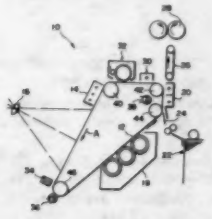
1. In a method for controlling an image forming apparatus which is provided with a plurality of developing means for accommodating different kinds of developers for developing electrostatic latent image formed on a photoconductor to form an image, the method comprising the steps of:
counting the number of image forming process; and
prohibiting image forming operation when the counted number of image forming process has reached a predetermined value, and executing the following three steps of,
(1) sticking a predetermined kind of developer to the photoconductor by use of a predetermined developing means without forming electrostatic latent image on the photoconductor,
(2) removing the developer from the photoconductor by a cleaning means, and
permitting image forming operation after the above two steps are executed.

4,945,389

METHOD OF CLEANING A PHOTOCONDUCTIVE ELEMENT OF AN IMAGE RECORDER

Noriyuki Usui, Kawasaki, and Tsumori Satoh, Yokosuka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 23, 1989, Ser. No. 356,058
Claims priority, application Japan, May 23, 1988, 63-125197
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—296 6 Claims



1. A cleaning method for removing toner particles remaining on a photoconductive element which is installed in an image recorder, said method comprising the steps of:
(a) producing a predetermined number of copies; then
(b) measuring a potential being deposited on a surface of the photoconductive element after said surface has been discharged and prior to a cleaning step; then
(c) comparing the measured potential of the surface of the photoconductive element with a predetermined reference potential; and then, still prior to the cleaning step,
(d) adjusting an output voltage for discharging the surface of the photoconductive element on the basis of a result of the comparison such that the surface potential of the photoconductive element is controlled to a predetermined value.

4,945,390

IMAGE-FORMING APPARATUS

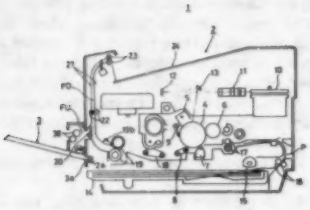
Hirofumi Hasegawa; Hiroaki Kojima; Yasuhiro Matsuura; Naoto Ohmori, and Yukio Yamada, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1989, Ser. No. 357,021
Claims priority, application Japan, Jun. 1, 1988, 63-136278
Int. Cl.[5] G03G *15/00*
U.S. Cl. 355—321 6 Claims

1. An image-forming apparatus comprising:
a machine body including image-forming means for forming an image on one side of recording paper, a first tray, a first transport passage means for discharging the recording paper with said one side facing down onto said first tray,

and a second transport passage means branched from said first transport passage means; and

a paper discharge unit removably attached to said machine



body and including a second tray, and discharge roller means for discharging the recording paper delivered through said second transport passage means with said one side facing up onto said second tray.

4,945,391

SEMICONDUCTOR DEVICE HOUSING WITH LASER DIODE AND LIGHT RECEIVING ELEMENT

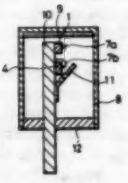
Hideya Yagoura, and Isamu Yamamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 46,358, May 6, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,660

Claims priority, application Japan, May 6, 1986, 61-105316

Int. Cl.[5] H01L *31/12*

U.S. Cl. 357—19 **3 Claims**



1. A semiconductor device, comprising: a planar substrate (10), a laser diode (1) disposed on one surface of said substrate for simultaneously emitting both a first, output laser beam (21) in a first direction parallel to said substrate and a second, monitor laser beam (20) in a second direction opposite to said first direction and parallel to said substrate, a light receiving element (4) disposed on said one surface of the substrate, spaced from the laser diode, and having a light receiving surface (4*a*) parallel to said substrate, a plurality of wiring patterns (13*a*, 13*b*, 13*c*) disposed on said one surface of the substrate wherein said laser diode and said light receiving element are each connected through a lead wire to a corresponding one of said wiring patterns, and a flat plate (11) mounted on said one surface of the substrate and having a reflecting surface (11*a*) disposed in the path of said monitor laser beam and oriented to reflect said monitor laser beam onto the light receiving surface of said light receiving element, said plate being disposed at an acute angle to said one surface of the substrate.

4,945,392

STATIC INDUCTION TRANSISTOR AND MANUFACTURING METHOD OF THE SAME

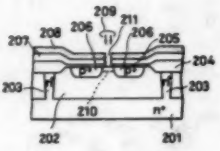
Yoshinori Ohta, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,278

Claims priority, application Japan, Apr. 28, 1987, 62-103134

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 **21 Claims**



1. A vertical static induction transistor in which a first type of high-resistance semiconductor has in a surface region thereof a source region of a first type of diffusion layer, and a gate region which surrounds said source region from at least two directions and said gate region is a second type of diffusion layer which is at a depth in said surface region which is deeper than a depth of said first type of diffusion layer in said source region, said vertical static induction transistor comprising:

one of a first and a second type of impurity layers, said first type of impurity layer increases the impurity density of said first type of high-resistance semiconductor, and said second type of impurity layer has a maximum density exceeding that of the impurity density of said first type of high-resistance semiconductor, said one of said first and second type of impurity layers being disposed within a region of said first type of high-resistance semiconductor surrounded by said gate region, between (a) a depth which is deeper than a surface of the first type semiconductor but shallower than a depth of said source region and (b) a depth which is deeper than the source region but shallower than a depth of said gate region.

4,945,393

FLOATING GATE MEMORY CIRCUIT AND APPARATUS

Fabio Beltram, Jersey City; Federico Capasso, Westfield; Roger J. Malik, Summit, and Nitin J. Shah, Scotch Plains, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 209,466, Jun. 21, 1988, Pat. No. 4,905,063. This application Dec. 7, 1989, Ser. No. 447,286

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.5 **3 Claims**

1. A memory circuit comprising

a plurality of write lines, read lines, power supply lines, and row select lines,

a plurality of memory cells connected to said lines, each of said cells comprising

a memory device which includes

source, drain and control gate electrode means,

a semiconductor channel for conducting carriers from said source to said drain means, and

a semiconductor heterostructure disposed between said channel and control gate means, said heterostructure including a floating gate potential well for confining carriers in a region sufficiently close to said channel to at least partially deplete it and further including a graded bandgap injector region for controlling the flow of carriers between said control gate means and said potential well,

said source means being connected to a source of reference potential,

a first FET having its channel connected between said

gate means of said memory device and one of said write lines,

a second FET having its channel connected between said drain means of said memory device and one of said read lines and one of said power supply lines,

the gates of said FETs being connected to one of said row select lines, and

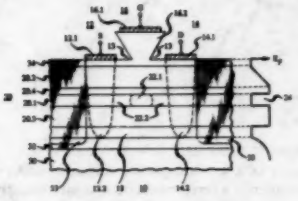
circuit means for maintaining the voltage on said supply line essentially constant.

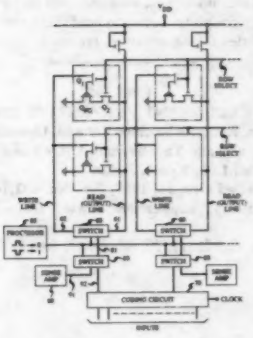
3. Optical detection apparatus comprising

an array of memory devices each comprising

source, drain and control gate electrode means,

a semiconductor channel for conducting carriers from said source to said drain means, and





a semiconductor heterostructure disposed between said channel and control gate means, said heterostructure including a floating gate potential well for confining carriers in a region sufficiently close to said channel to at least partially deplete it and further including a graded bandgap injector region for controlling the flow of carriers between said control gate means and said potential well

means for injecting carriers into the wells of said devices,

means for making light incident on said array so as to remove carriers from at least one of said devices, thereby generating an electrical signal therefrom, and

means for detecting said signal.

4,945,394

BIPOLAR JUNCTION TRANSISTOR ON SILICON CARBIDE

John W. Palmour, Raleigh, and John A. Edmond, Apex, both of N.C., assignors to North Carolina State University, Raleigh, N.C.

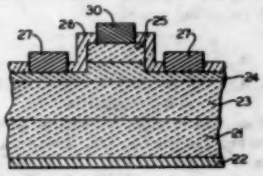
Filed Oct. 26, 1987, Ser. No. 113,692
Int. Cl.[5] H01L 29/72
U.S. Cl. 357—34 **6 Claims**

1. A mesa bipolar junction transistor formed from silicon carbide and capable of operating at temperatures over 500° C. and under conditions of high radiation density, and comprising:

a single crystal substrate formed of silicon carbide;

a collector formed of an epitaxial layer of silicon carbide on said single crystal substrate and having a first conductivity type;

a base adjacent said collector formed of an epitaxial layer of doped silicon carbide upon said collector and having the opposite conductivity type from said collector, with said base having the bottom segment of a mesa structure extending from the surface thereof;



an emitter formed of an epitaxial layer of silicon carbide upon said bottom segment of said mesa structure of said base and having the same conductivity type as said collector so that said bottom segment and said emitter together form said mesa structure with a substantially planar p-n junction between said emitter and said base in said mesa structure; and

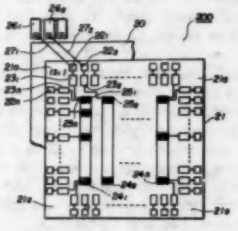
respective ohmic contacts upon said base, said emitter, and said collector.

4,945,395

SEMICONDUCTOR DEVICE

Yoshiyuki Suehiro, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 346,302, May 2, 1989, abandoned, which is a continuation of Ser. No. 84,050, Aug. 11, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 449,435
Claims priority, application Japan, Aug. 12, 1986, 61-189098
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—40 **11 Claims**



1. A semiconductor device comprising:

an integrated-circuit chip having an internal cell region and peripheral regions surrounding said internal cell region;

basic cells formed in said internal cell region on said integrated-circuit chip;

pads for input/output cells used for interfacing with an external device, said pads being arranged in outer portions of the peripheral regions on said chip;

first logical circuit means provided for each of said input-/output cells, each including logic circuits formed by transistors which are a part of said respective input/out cells, said first logic circuit means being positioned in

inner portions of said peripheral regions, said transistors in said logic circuits having a drive capability higher than that of a transistor formed by said basic cells, said first logic circuit means being arranged along four edges of said integrated-circuit chip, said first logic circuit means including protection circuit means for protecting said related input/output cell against an over-voltage resulting from electrostatic discharge; and

a second logic circuit means provided for each of said input-/output cells, each including remaining logic circuits of said respective input/output cells, said second logic circuit means being formed by said basic cells formed in said internal cell regions, so that each of said input/output cells is formed by one pad and the combination of said first and second logic circuit means.

4,945,396

SEMICONDUCTOR DEVICE HAVING DARLINGTON TRANSISTORS

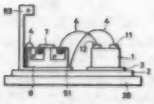
Hisao Shigekane, and Shinichi Ito, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 123,917, Nov. 23, 1987, abandoned. This application Dec. 15, 1989, Ser. No. 449,412

Claims priority, application Japan, Dec. 15, 1986, 61-297895; Mar. 18, 1987, 62-63590

Int. Cl.[5] H01L *27/02, 29/72, 29/747*

U.S. Cl. 357—46 **6 Claims**



1. A semiconductor device comprising:

a substrate having an insulating layer;

a first transistor of a first type mounted on said insulating layer and having a first base electrode, a first collector electrode, and a first emitter electrode;

Darlington transistor means of said first type having an external base region, an external collector region, and an external emitter region, and comprising a plurality of Darlington connected second transistors each of second transistors having a base region of a second conductivity type formed in a semiconductor layer of a first conductivity type, a collector region being part of said semiconductor layer and being common to all of said second transistors, and an emitter region of said first conductivity type formed in each of said base regions, said Darlington transistor means being mounted on said insulating layer and insulated from said first transistor;

a second base electrode connected to said external base region;

a second collector electrode connected to said external collector region;

a second emitter electrode connected to external emitter region; and

connecting means for coupling said first base electrode to said second collector electrode and said second base electrode, and for coupling said first emitter electrode to said second emitter electrode;

wherein the collector current of said first transistor is limited by a reference voltage applied by said Darlington transistor means between said first base electrode and said first emitter electrode.

4,945,397

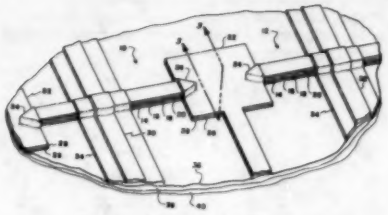
RESISTIVE OVERLAYER FOR MAGNETIC FILMS

James A. Schuetz, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 939,315, Dec. 8, 1986. This application Jul. 11, 1989, Ser. No. 378,561

Int. Cl.[5] G11C *11/15*

U.S. Cl. 357—71 **7 Claims**



1. A magnetic solid state device comprising;

a first layer of a ferromagnetic, magnetoresistive material;

a second layer of a ferromagnetic, magnetoresistive material; and

a third layer interposed between, and in contact with said first and second layers, wherein said third layer prevents exchange coupling between said first and second layers and includes nitrogen doped tantalum.

4,945,398

OVERCURRENT PREVENTIVE DIODE

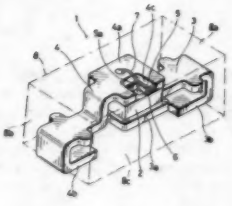
Yoshio Kurita, Kyoto; Katsuhiro Takami, Oumihachiman; Kenji Tanaka, Kyoto, and Yuji Kosumi, Uji, all of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Oct. 16, 1989, Ser. No. 421,761

Claims priority, application Japan, Oct. 20, 1988, 63-137016[U]

Int. Cl.[5] H01L *27/02, 23/48, 23/28, 23/02*

U.S. Cl. 357—74 **10 Claims**



1. An overcurrent preventive diode comprising:

a diode chip having a pair of bonding surfaces;

a first lead having a bonding end bonded to one bonding surface of said diode chip into electrical and heat conduction therewith;

a thin electrical insulating layer covering the other bonding surface of said diode chip but having an opening for exposing an electrical connecting portion of said other chip surface;

a second lead having a bonding end provided with an opening in corresponding relation to said opening of said insulating layer, said bonding end of said second lead being held in heat conduction with said diode chip via said insulating layer;

a fusing wire bonded both to said bonding end of said second lead and to said electrical connecting portion of said other

chip surface, said wire being melt-cut upon passage of a predetermined overcurrent; and

a molded resinous body enclosing said diode chip, both of said bonding lead ends, and said fusing wire.

4,945,399

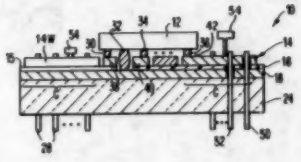
ELECTRONIC PACKAGE WITH INTEGRATED DISTRIBUTED DECOUPLING CAPACITORS

Michael B. Brown, Binghamton; William S. Ebert, Endicott; Leonard T. Olson, Endwell, and Richard R. Sloma, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 913,435, Sep. 30, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 300,681

Int. Cl.[5] H01L *23/02*

U.S. Cl. 357—74 **3 Claims**



1. An electronic packaging structure comprising:

(a) a substrate;

(b) a layer of metallurgy on the substrate, said layer of metallurgy having a pad for unitary intermetallic electrical connections and including at least one portion forming a first plate of a capacitor;

(c) a dielectric layer covering the layer of metallurgy;

(d) a layer of metallurgy deposed on the dielectric layer, forming a second plate of said capacitor and having at least one pad for unitary intermetallic electrical attachment thereto, said second plate positioned relative to the first plate of the capacitor and separated therefrom by a portion of the dielectric layer;

(e) said electronic packaging structure having a plurality of apertures extending from the bottom of said substrate to the top of said second plate of said capacitor, said apertures extending through the plates of said capacitor;

(f) a semiconductor chip mounted on the layer of metallurgy disposed on the dielectric layer, the semiconductor chip being electrically connected to both of said layers of metallurgy by a plurality of unitary intermetallic electrical connections; and

(g) a plurality of pins extending entirely through said apertures, thereby providing electrical connections between said semiconductor chip and the bottom of said substrate.

4,945,400

SUBASSEMBLY FOR OPTOELECTRONIC DEVICES

Greg E. Blonder, Summit, and Bertrand H. Johnson, Murray Hill, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 163,664, Mar. 3, 1988, Pat. No. 4,897,711. This application Oct. 30, 1989, Ser. No. 429,107

Int. Cl.[5] H01L *23/02;* **G02B** *6/30*

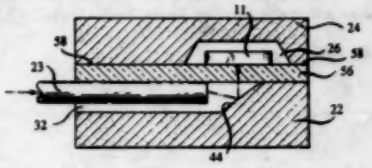
U.S. Cl. 357—74 **12 Claims**

1. A subassembly for an optoelectronic device comprising

a first member which is transparent to light transmitted between said device and the exterior of said subassembly, said device being mounted on one side of said first member,

a semiconductor lid mounted on said one side of said first member and hermetically sealed thereto, said lid having a cavity therein for receiving said device,

a semiconductor second member mounted on another side of said first member, said second member having a groove therein adapted to receive an optical fiber, said groove having side walls and an oblique end face formed by crystallographic planes, and



a reflector disposed on said end face to direct light between said fiber and said device and through said first member.

4,945,401

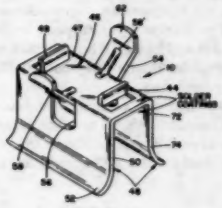
HEAT DISSIPATOR FOR SEMICONDUCTOR UNIT

Edmund G. Trunk, East Meadow, and Seymour Wilens, Wantagh, both of N.Y., assignors to The Staver Company Inc., Bay Shore, N.Y.

Continuation of Ser. No. 75,572, Jul. 20, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 247,719

Int. Cl.[5] H01L *23/34, 23/36, 23/40*

U.S. Cl. 357—81 **12 Claims**



1. A heat dissipator for retaining and supporting a generally rectangular semiconductor unit on a circuit board, said semiconductor unit having flat opposite ends, flat top, flat opposite sides, and a pair of laterally extending metal legs, said heat dissipator comprising:

a highly heat conductive stamped sheet metal member, said member having:

a planar base;

a pair of spaced springy tabs struck out from and extending away from one side of said base, each of said tabs engaging respectively one of said opposite ends of said semiconductor unit, with only said top of said semiconductor unit abutting said base for conduction of heat from said semiconductor unit;

a pair of rigid, platelike wings diverging at least in part from each other and bent away from the other side of said base to conduct and to radiate heat away from said semiconductor unit; and

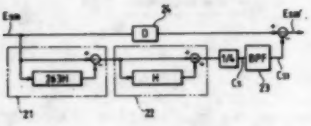
a pair of spaced base legs stuck out from said wings, and disposed laterally of said base at obtuse angles to said wings, to engage said legs of said semiconductor unit, to conduct and radiate heat therefrom, and to cooperate with said tabs in retaining said semiconductor unit on said base and on said circuit board, said base legs being formed with longitudinal ridges terminating at said base for strengthening and maintaining rigidity of said base legs, and for maximizing conduction and radiation of heat from said semiconductor unit via said legs of said semiconductor unit.

4,945,402

METHOD FOR PRODUCING NTSC COMPATIBLE SIGNAL FOR WIDESCREEN TV SYSTEM

Takahiko Fukinuki, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,840
Claims priority, application Japan, Nov. 11, 1987, 62-283282
Int. Cl.[5] H04N 7/08, 11/06
U.S. Cl. 358—12 1 Claim



1. A method for producing an NTSC system compatible television signal for a widescreen television system having a widescreen panel, comprising the steps of:

deriving a luminance signal of a central portion of the widescreen panel;

deriving a color signal modulated in response to the luminance signal according to the NTSC system;

deriving a time-expanded luminance signal of two sides of the widescreen panel modulating a sub-carrier so that a scanning line of identical phase drops down for each field;

deriving a time-expanded color signal of the two sides of the widescreen panel modulating the sub-carrier having a phase which is the same in every scanning line in a field and which is inverse with respect to the phase for the adjacent fields and having a horizontal frequency which is higher than the horizontal frequency of the time-expanded luminance signal; and

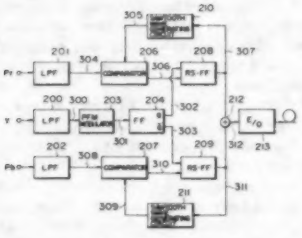
multiplexing the luminance signal, the color signal, the time-expanded luminance signal and the time-expanded color signal so as to enable production of the NTSC compatible television signal for the widescreen television system.

4,945,403

COLOR TELEVISION FORMAT USING PULSE FREQUENCY AND PULSE WIDTH MODULATION

Kiyoshi Kubo, Katano; Noboru Okamura, Kadoma, and Susumu Morikura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1988, Ser. No. 289,825
Claims priority, application Japan, Jan. 25, 1988, 63-13885
Int. Cl.[5] H04N 11/04, 11/00
U.S. Cl. 358—13 15 Claims



1. A signal transmission method comprising the steps of:

pulse frequency modulating a luminance signal in a component video signal including the luminance signal and two color difference signals;

pulse width modulating said pulse frequency modulated signal sequentially by said two color difference signals alternately to form one pulse train signal; and

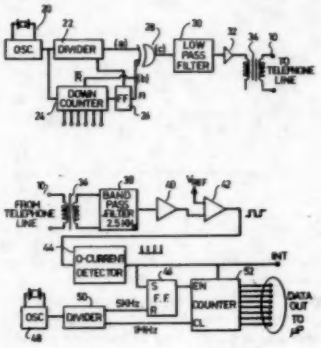
transmitting said component video signal in form of said one pulse train signal.

4,945,404

VIDEO COMMUNICATION SYSTEM AND PHASE OR FREQUENCY MODULATOR INCLUDED THEREIN

Gershon Miller, Rehovot, Israel, assignor to Medason Ltd., Jerusalem, Israel

Filed May 6, 1988, Ser. No. 191,103
Claims priority, application Israel, May 15, 1987, 82539
Int. Cl.[5] H04N 7/04, 7/14
U.S. Cl. 358—141 19 Claims



1. A video communication system for transmitting still pictures of a scene during periodic intervals each of a predetermined duration, comprising:

a T.V. camera producing video analog signals of the scene to be transmitted;

an analog-to-digital converter converting the video analog signals to pixel digital signals representing the gray level of each pixel in the scene;

a memory for storing said pixel gray levels for the predetermined duration;

generator means for generating a carrier wave;

and a modulator for modulating said carrier wave by said pixel gray levels from said memory;

said modulator being a phase modulator which shifts the cross-over point of the carrier wave no more than 180° according to the gray level of the respective pixel in said picture.

4,945,405

COLOR IMAGE READ APPARATUS WITH SHADING AND COLOR BALANCE CORRECTION

Yoshihiko Hirota, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1988, Ser. No. 197,833
Claims priority, application Japan, May 21, 1987, 62-126819; May 21, 1987, 62-126820; May 21, 1987, 62-126821; May 21, 1987, 62-126822; May 21, 1987, 62-126823; Jun. 17, 1987, 62-153126; Jun. 17, 1987, 62-153127; Jun. 17, 1987, 62-153128; Jun. 17, 1987, 62-153129
Int. Cl.[5] H04N 1/40
U.S. Cl. 358—75 10 Claims

1. A color image read apparatus, comprising:

a color image sensor which reads a color original, decomposes it into plural colors and outputs image signals of plural colors;

a scanning means for moving said color image sensor relatively to said color original;

a reference white pattern which is installed upstream in the scanning direction of said color original and is read by said color image sensor prior to said color original; and

shading correcting means for making shading correction for said read image signals of plural colors, wherein said shading correcting means includes,

a reference data obtaining means for obtaining one reference data from image signals of plural colors obtained by reading said reference white pattern, wherein said reference data is an average value of image signals of plural colors in reading said reference white pattern,

a reference data storing means for storing said reference data, and

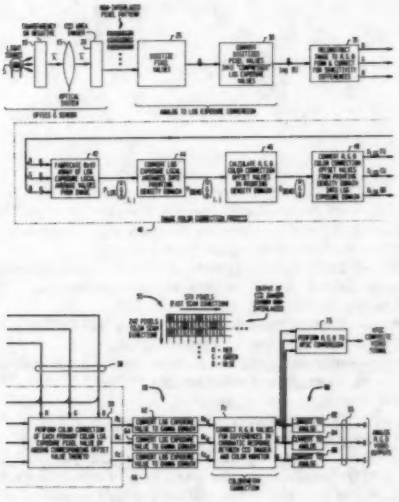
a calculating means for correcting, using the reference data, said image signals of plural colors obtained by reading said color original.

4,945,406

APPARATUS AND ACCOMPANYING METHODS FOR ACHIEVING AUTOMATIC COLOR BALANCING IN A FILM TO VIDEO TRANSFER SYSTEM

David R. Cok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,867
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—80 **30 Claims**



1. In a system for transferring an image from a first display format to a second display format, a method for balancing the colors present in the image prior to the image being transferred to said second display format, said method comprising the steps of:

providing a first set of digitized color values in a first domain for each pixel in a scanned image, wherein each of said digitized color values in said first set is associated with a separate primary color in said image;

determining a set of local average values from said digitized color values that collectively form said scanned image, wherein each of said local average values is formed by averaging the digitized color values associated with a particular primary color for pixels that are situated within a pre-defined portion of said scanned image;

converting the local average values from the first domain to a second domain to provide converted local average values;

determining, in response to said converted local average values, a set of color correction offset values in said second domain, wherein each of said color correction offset values is associated with a particular one of said primary colors;

converting each of said color correction offset values from said second domain to said first domain so as to generate a set of color correction offset values, wherein each of said color correction offset values is associated with a corresponding one of said primary colors;

adding each one of said color correction offset values to a corresponding one of the color values in a second set of digitized color values in said first domain and associated with a corresponding primary color for each pixel in the scanned image in order to produce a set of color balanced color values in said first domain for each of said pixels in said image; and

providing, in response to each of said color balanced color values for each of said pixels in said scanned image, color balanced values in said second display format for each of the pixels in the scanned image.

4,945,407

HIGH DEFINITION, THREE-DIMENSIONAL TELEVISION

Douglas F. Winnek, 28091 Robinson/Canyon Rd., Carmel, Calif. 93923

Filed May 12, 1989, Ser. No. 351,241
Int. Cl.[5] H04N *13/00*
U.S. Cl. 358—88 **23 Claims**

1. Apparatus for use in making three-dimensional pictures comprising:

a lens system adapted to receive light rays from an object to be viewed in three dimensions;

a charge coupled device optically aligned with the lens system to receive light rays therefrom; and

a lenticular screen adjacent to the device for forming three-dimensional images from the light rays passing toward the device, whereby the images will be received by the device and thereafter can be processed to form three-dimensional pictures.

4,945,408

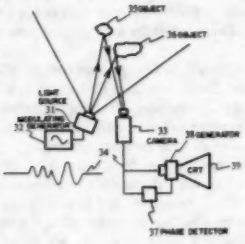
THREE DIMENSIONAL STEREOSCOPIC VIDEO SYSTEM WITH A SINGLE IMAGE SENSOR

Antonio Medina, P.O. Box 1002, Pasadena, Calif. 91102

Continuation-in-part of Ser. No. 66,497, Jun. 26, 1987. This application Aug. 15, 1988, Ser. No. 232,424

Int. Cl.[5] H04N *13/00*

U.S. Cl. 358—88 **10 Claims**



1. A three dimensional display system comprising:

means for emitting a beam of energy in the form of a series of scans with each scan falling into one of at least two groups having characteristics distinguishing one from the other;

detector means for detecting said beam of energy when reflected from objects during said scanning; and

means for separating and segregating said reflected energy by said distinguishing characteristics for segregated display of different groups of each eye of a viewer to create a stereoscopic image.

4,945,409

ENDOSCOPE APPARATUS FOR DISPLAYING IMAGES BELOW THE MUCOUS MEMBRANCE

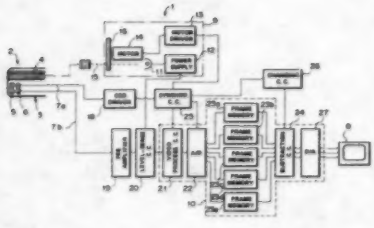
Kazunari Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,194

Claims priority, application Japan, Jun. 11, 1987, 62-145532

Int. Cl.[5] H04N *7/18, 5/335;* A61B *1/06*

U.S. Cl. 358—88 **16 Claims**



1. An endoscope apparatus comprising:

an elongated insertable part having an illuminating window and observing window in a tip part;

a light source part emitting an illuminating light;

a light guide means, inserted through said insertable part, for transmitting said illuminating light and for illuminating an object from said illuminating window;

an imaging means for receiving the reflected light from said object through said observing window and for converting said reflected light to an electric signal;

a light separating means interposed in an optical path of said illuminating light between said light source part and imaging means, for separating the light entering said imaging means into a plurality of wavelength bands, said light includes at least a range other than a visible range;

a video signal processing means for processing the output signal of said imaging means to produce a video signal;

an operating means for removing video information included in one video signal by operating on at least two of a plurality of video signals based on light of said plurality of wavelength bands separated by said light separating means which are output signals of said video signal processing means;

a changing means for selecting at least one of the video image information output by said operating means and a video signal and for composing a usual color observing picture image output from said signal processing means; and

a monitor means for displaying a picture image from input signals selected by said changing means.

4,945,410

SATELLITE COMMUNICATIONS SYSTEM FOR MEDICAL RELATED IMAGES

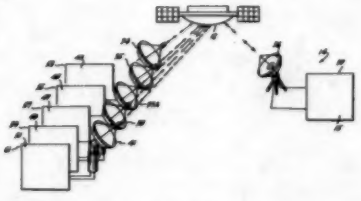
Paul J. Walling, San Bernardino, Calif., assignor to Professional Satellite Imaging, Inc., Colton, Calif.

Continuation-in-part of Ser. No. 12,450, Feb. 9, 1987, Pat. No. 4,802,008. This application Oct. 24, 1988, Ser. No. 262,566

The portion of the term of this patent subsequent to Jan. 13, 2006, has been disclaimed.

Int. Cl.[5] H04N *1/00, 7/12*

U.S. Cl. 358—141 **12 Claims**



1. A satellite communication system for sending high resolution, medically related, static images from one or more remote satellite locations to a central location for diagnostics, said satellite communication system comprising:

each szid one or more remote satellite locations comprising:

means for converting the high resolution images into voltage analog signals;

means for converting the voltage analog signals into narrow bandwidth and low frequency signals;

means for transmitting the narrow bandwidth and low frequency signals to a satellite; and

said central location comprising:

means for receiving the narrow bandwidth and low frequency signals;

means for converting the received narrow bandwidth and low frequency signals back into the voltage analog signals;

means for converting the voltage analog signals into digital signals;

means for converting the digital signals into high resolution, digitized, medically related images;

means for transmitting diagnostics of the high resolution, medically related images, in voice or readable form, from

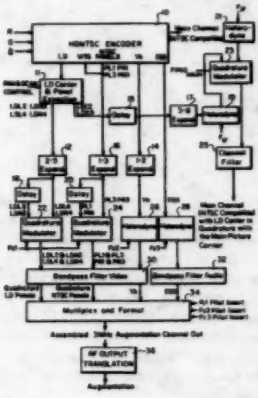
the central location to the transmitting remote satellite location.

4,945,411

HDNTSC CHANNEL WITH TIME AND FREQUENCY MULTIPLEXING

Alan P. Cavallerano, Ossining; Carlo Basile, Flushing, and Mikhail Tsinberg, Riverdale, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 239,148
Int. Cl.[5] H04W 7/04
U.S. Cl. 358—141 **14 Claims**



14. A method for providing high definition television signals for transmission comprising the steps of:

generating conventional television signals, line differential signals, left and right panel signals, luminance signals, and a digital signal packet comprising audio and synchronization signals,

separating said line differential signals into left panel line differential signals, center segment line differential signals, and right panel line differential signals;

time expanding said left and right panel line differential signals, said left and right panel signals, and said luminance signals to obtain time expanded left and right panel line differential signals, time expanded left and right panel signals, and time expanded luminance signals;

quadrature modulating said time expanded left and right panel line differential signals and said time expanded left and right panel signals, to obtain quadrature modulated time expanded left and right panel line differential signals and quadrature modulated time expanded left and right panel signals within a common frequency band;

converting said time expanded luminance signals to said common frequency band;

time multiplexing said quadrature modulated time expanded left and right panel line differential signals, said quadrature modulated time expanded left and right panel signals, and said time expanded luminance signals to obtain a time multiplexed signal;

converting said digital signal packet to occupy a frequency band contiguous with said common frequency band;

combining said time multiplexed signal and said digital signal pocket signal to establish a frequency multiplexed signal;

time expanding said center segment line differential signal to be of a time duration consistent with horizontal line durations of said television signals, thereby providing time expanded center segment line differential signals; and

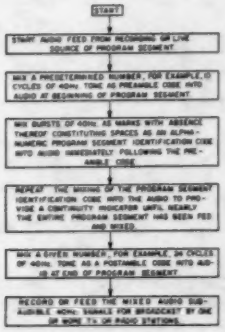
quadrature modulating said time expanded line differential signals with said conventional television signals.

4,945,412

METHOD OF AND SYSTEM FOR IDENTIFICATION AND VERIFICATION OF BROADCASTING TELEVISION AND RADIO PROGRAM SEGMENTS

Robert A. Kramer, 627 14th St., Santa Monica, Calif. 90402

Continuation-in-part of Ser. No. 206,294, Jun. 14, 1988. This application Apr. 25, 1989, Ser. No. 344,064
Int. Cl.[5] H04N 7/08, 7/087
U.S. Cl. 358—142 **37 Claims**



1. A system for identification and verification of broadcasted program segments, the system comprising:

a plurality of broadcasting stations, including at least one television broadcasting station, for broadcasting signals which include program segments having a subaudible preamble code, respective subaudible program segment identification codes, following each preamble code occurrence, a subaudible postamble code following each program segment identification code occurrence and, in the case of television broadcast stations a video signal;

at least one monitoring station for receiving the broadcasted signals, said monitoring station including (a) means for generating date-indicating and time-indicating signals, (b) respective channels responsive to the broadcasted signal from each respective broadcasting station for recovering each received preamble code, each received respective program segment identification code, each received postamble code and, for monitored television broadcast stations, each video signal to develop therefrom video presence and/or absence signals at least during periods between each received preamble code and each received postamble code, and (c) means for providing respective broadcast station-identification signals;

means at the monitoring station for storing data signal representations of each recovered preamble code, recovered respective program segment identification codes, recovered postamble code, the developed video presence and/or absence signals, the date-indicating and time-indicating signals, and the station-identifying signals for each channel; and

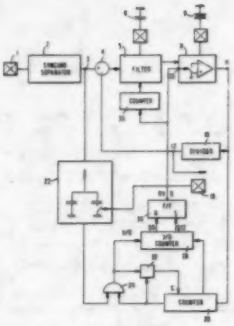
means at the monitoring station for sending the stored data signal representations to a central station, the central station being provided with means for receiving data from a plurality of monitoring station to compile and/or to reconcile same.

4,945,413

LINE SYNCHRONIZATION DETECTION CIRCUIT

Jean-Marc Merval, Saint Egreve, and Danika Perrin, Grenoble, both of France, assignors to SGS-THOMSON Microelectronics S.A., Gentilly, France

Filed Feb. 17, 1989, Ser. No. 312,006
Claims priority, application France, Feb. 19, 1988, 88 02266
Int. Cl.[5] H04N *5/12, 5/10*
U.S. Cl. 358—158 **8 Claims**



1. A line synchronization signal detection circuit for detecting a line synchronization signal in a video signal wherein the synchronization signal is supplied to a phase locked loop comprising a voltage controlled oscillator (VCO) (8) for supplying a line scanning signal to a display means, said detection circuit comprising:

first means (20) for inhibiting the operation of the loop whereby the VCO freely oscillates at its free frequency, wherein said free frequency is substantially equal to a desired line frequency or multiple of said desired line frequency, in the absence of an enabling signal;

second means (26, 40, 42, 54, 56) for generating a detection window in relation with the oscillations of the VCO;

third means (24, 44) for detecting the presence of the synchronization signal in said window;

fourth means (28, 30, 46-52) comprising an up/down counter (28) selectively operable in incrementing and decrementing modes in response to the output of the third means, and flip-flop means (30) for supplying said enabling signal in response to said up/down counter reaching a predetermined count and until said counter has counted down to a null value.

4,945,414

COMPENSATOR FOR TEMPERATURE-INDUCED BLACK LEVEL DRIFT FOR USE IN A TELEVISION RECEIVER

Thomas D. Gurley, and Gene K. Sendelweck, both of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed May 12, 1988, Ser. No. 193,430
Int. Cl.[5] H04N *5/52, 5/57*
U.S. Cl. 358—168 **9 Claims**

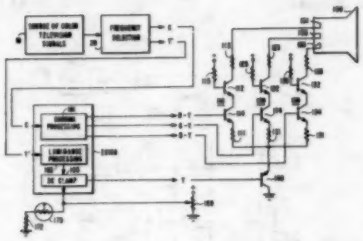
1. Apparatus in a television receiver for compensating for the effects of temperature variations comprising:

a circuit board;

an integrated circuit including amplifier means, mounted on said circuit board, and having an input terminal for receiving signals to be amplified, an output terminal for developing amplified signals, and a magnitude control input terminal for receiving magnitude control signals for controlling the magnitude of said amplified signals;

means for generating said magnitude control signals and applying said magnitude control signals to said magnitude control input terminal; and

means, external to said integrated circuit and exhibiting an impedance which is dependent upon temperature, for sensing variations in said temperature and for modifying said impedance in accordance with a given temperature coefficient in response to said variations in temperature, said temperature-responsive impedance means being mounted on said circuit board proximate to said magnitude control input of said amplifier of said integrated



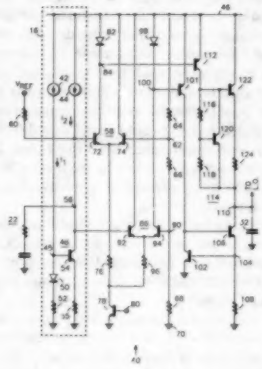
circuit for receiving instantaneous self-induced temperature variations generated by said amplifier of said integrated circuit and for receiving ambient heat, said temperature-responsive impedance means being coupled to said magnitude control input terminal and to said means for generating magnitude control signals and being responsive to said instantaneous self-induced temperature variations of said amplifier of said integrated circuit and to ambient temperature for controlling the magnitude of said amplified signals.

4,945,415

SLEW ENHANCEMENT CIRCUIT FOR AN AUTOMATIC FREQUENCY CONTROL SYSTEM

Michael McGinn, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1988, Ser. No. 237,463
Int. Cl.[5] H04N *5/50*; H04B *1/18*
U.S. Cl. 358—195.1 **6 Claims**



1. A circuit responsive to an applied input signal for either sourcing or sinking current at an output thereof, comprising:

bias circuit means for supplying first and second reference potentials at respective first and second outputs thereof;

a first comparator having first and second inputs and an

output, said first input of said first comparator being coupled to input of the circuit and said second input of said first comparator being coupled to said second output of said bias circuit means, said first comparator being responsive to the applied input signal being greater than said second reference potential for providing an output signal at said output of said first comparator;

a second comparator having first and second inputs and an output, said first input of said second comparator being coupled to said input of the circuit and said second input of said second comparator being coupled to said first output of said bias circuit means, said second comparator being responsive to the input signal being less than said first reference potential for providing an output signal at said output of said second comparator;

first circuit means coupled between said output of said first comparator and the output of the circuit and being responsive to said first comparator for sourcing current to the output of the circuit; and

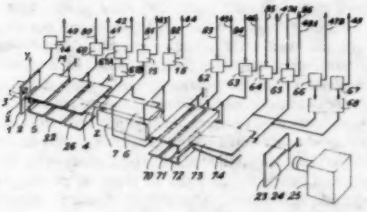
second circuit means coupled between said output of said second comparator and the output of the circuit and being responsive to said second comparator for sinking current at the output of the circuit.

4,945,416

ULTRA-RAPID ELECTRONIC CAMERA

Pierre Salgues, Massy, and Roger Verrecchia, Lesigny, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Feb. 17, 1989, Ser. No. 312,606
Claims priority, application France, Feb. 17, 1988, 88 01867
Int. Cl.[5] H04N 5/30
U.S. Cl. 358—209 **3 Claims**



1. An ultra rapid electronic digitally controlled camera apparatus for the study of very brief light phenomena, comprising a bilamellar optical image conversion tube, said tube comprising in succession along an axis a plane photocathode perpendicular to said axis, defined by a narrow aperture for receiving photons from the phenomena being studied and emitting electrons, a pair of plane electron accelerating electrodes parallel to said aperture and to said axis, a quadrupolar spatial focusing lens comprising a first and a second pair of mutually parallel cylindrical electrodes perpendicular to said aperture and parallel to said axis;

a temporal focusing lens comprising at least a first, a second and a third pair of electrodes parallel to said aperture and to said axis, a screen for forming an image from the aperture, the camera further comprising a means for recording the image formed on the screen;

a plurality of adjustable electrical sources respectively supplying adjustable voltage values at their outlets, said source outlets being respectively connected to the first pair of electrodes and to the second pair of electrodes of the quadrupolar lens, to the second and third pairs of electrodes of the temporal focusing lens;

an electrical supply source providing fixed value voltage at one outlet, said outlet being connected to the photocathode, the first pair of electrodes of temporal focusing lens, the pair of accelerating electrodes and the screen being connected to a reference mass, all the sources being situated near the tube, characterized in that the tube comprises, between the pair of acceleration electrodes and spatial focusing lens and along said axis, a pair of temporal prefocusing electrodes parallel to the axis and to the aperture and connected to an adjustable value voltage source;

a second pair of acceleration electrodes parallel to the axis and to the aperture, one of the electrodes of the second pair being connected by a shutter control means to a fixed value voltage source, another of the electrodes of the second pair being connected to a second reference mass, a pair of deflection plates parallel to the aperture, situated between the temporal focusing lens and the screen along said axis;

said pair of deflection plates being respectively connected to a pair of adjustable value voltage sources and respectively connected by a deflection control means, to a pair of fixed value voltage sources, all the sources being situated near the tube, the camera further comprising a control unit distant from at least one tube, to control a means of regulating values of voltage furnished by the sources of adjustable voltage and the respective measurements of voltage applied to the photocathode to the different electrodes and to the shutter control and deflection control devices, said adjustment and measurement means being situated near the tube; and

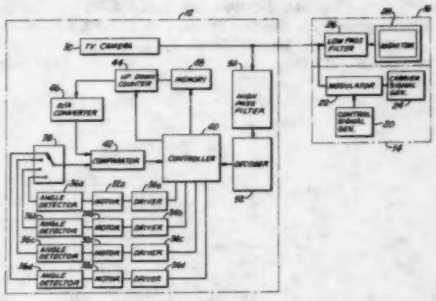
the control unit being connected to the adjustment and measurement devices by a pair of optic devices transmitting regulatory data to the voltage control devices and measurement instructions to the measurement devices, and transmitting measurement results to the control unit.

4,945,417

METHOD AND APPARATUS FOR REMOTELY PRE-SETTING CLOSED CIRCUIT TELEVISION CAMERA

David Elberbaum, Tokyo, Japan, assignor to Elbex Video, Ltd, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 271,200
Claims priority, application Japan, Nov. 16, 1987, 62-287549
Int. Cl.[5] H04N 5/30
U.S. Cl. 358—210 **3 Claims**



1. A television camera comprising:

imaging means for generating video signals;

driving means adapted to the imaging means to be rotated in order to change coordinates positions of said imaging means;

detecting means for detecting the angle of the coordinates positions of said imaging means as electrical signals;

memory means in which information is stored and from which the information is read out; and

controlling means for receiving a command to store control information for setting said imaging means in a predetermined coordinates position and a command to change the coordinates position of said imaging means, for storing output signals of said detecting means as the control infor-

mation in said memory means corresponding to the store command upon receipt thereof, for reading out from said memory means the control information corresponding to the change command upon receipt thereof, and for operating said driving means until the output signals of said detecting means coincide with the read-out control information,

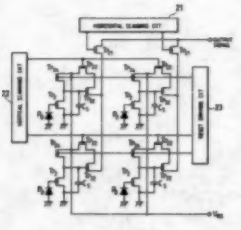
said controlling means including a counter in which the control information memorized in said memory means may be presei, a digital-to-analog converter for converting a counted value of said counter into an analog value, means for comparing output signals of said converter with the output signals of said detecting means and for generating coincidence signals when said output signals of said converter and said detecting means coincide with each other, and a controller for receiving the store command, the change command and the coincidence signals, for enabling said counter, upon receipt of the store command, to continue counting until the coincidence signals are generated, for storing the counted value of said counter, as the coincidence signals are generated, in said memory means at a portion thereof corresponding to the store command, for reading out from said memory means, upon receipt of the change command, the control information corresponding to the change command, for presetting the read-out control information in said counter, and for operating said driving means until the coincidence signals are generated.

4,945,418

SOLID STATE IMAGE PICKUP APPARATUS WITH CHARGE STORAGE DEVICE

Hideki Mutoh, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 31, 1989, Ser. No. 304,081
Claims priority, application Japan, Feb. 1, 1988, 63-19678
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.11 **15 Claims**



1. A solid state image pickup device, comprising:

a photodiode for receiving incident light and for performing photoelectric conversion of said incident light;

a first transistor coupled to said photodiode for converting a voltage produced across said photodiode into an electric current; and

a charge storage capacitor for storing an electric charge in response to said electric current,

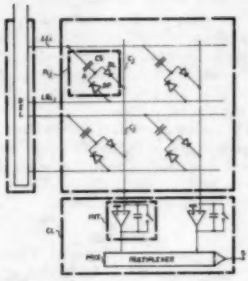
wherein said electric charge is stored in said charge storage capacitor with exclusive application of forwardly biased voltage to said photodiode.

4,945,419

PHOTOSENSITIVE MATRIX WITH TWO DIODES AND ONE CAPACITOR PER DOT WITHOUT OPTICAL RESETTING

Marc Arques, Grenoble, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 11, 1989, Ser. No. 295,664
Claims priority, application France, Jan. 15, 1988, 88 00413
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.11 **11 Claims**



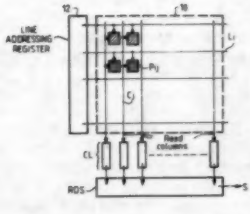
1. A matrix of photosensitive dots comprising a network of photosensitive dots arranged in rows (at least one row) and columns (at least one column), each photosensitive dot being located at the intersection of a row and a column, wherein each photosensitive dot comprises two diodes and one capacitor connected to a floating node, the capacitor being connected between a row conductor and the floating node, a first diode, called a reading diode, connected between the floating node and a column conductor to enable the transfer, between this column conductor and the floating node, of a quantity of charges generated at the floating node by the illumination of the photosensitive dot, and a second diode, called a photosensitive diode, connected between the floating node and a conductor connected to a resetting voltage source, firstly in order to generate, when it is illuminated, electrical charges on the floating node and, secondly, in order to reset the potential of the floating node at a chosen value after said charge transfer.

4,945,420

LOW NOISE READING METHOD AND CIRCUIT FOR LINE TRANSFER PHOTOSENSITIVE MATRICES

Jean-Luc Berger, and Marc Arques, both of Grenoble, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 4, 1989, Ser. No. 293,469
Claims priority, application France, Jan. 5, 1988, 88 00027
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.31 **9 Claims**



1. A method for the reading of electrical charges collected at an input conductor, comprising an operation for the transfer of charges from the input conductor to an intermediate storage

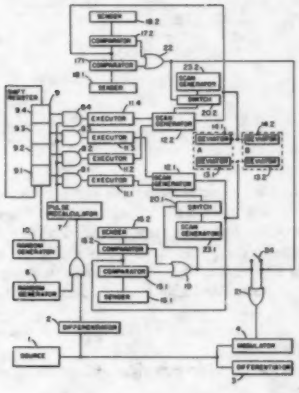
zone, this operation being repeated N times with N as a whole number greater than or equal to two, and an operation for a transfer, from the intermediate zone towards an output, of a quantity of charges proportionate to the sum of charges transferred during the N preceding transfer operations, and wherein each operation for the transfer of a quantity of charges Qs from the input conductor to the intermediate storage zone is followed by an operation for the duplication of charges by which there is formed a charge Qs* which is a replica of the charge Qs, the replica charge being in a pre-determined ratio with the initial charge, and then an operation for the restitution of the charge Qs to the input conductor.

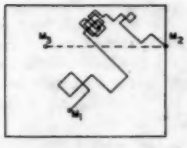
4,945,421

METHOD AND SYSTEM FOR REPRESENTING INFORMATION DATA WITH INTERROGATING ELEMENT DISPLACING FROM LIMIT INFORMATION FIELD BACK THE INFORMATION FIELD

Iosif Baumberg, 69 Bay 29 St., Brooklyn, N.Y. 11214

Filed Jul. 14, 1988, Ser. No. 219,445
Int. Cl.[5] H04N *3/30*
U.S. Cl. 358—217 **10 Claims**





1. A method of representing information data, comprising the steps of

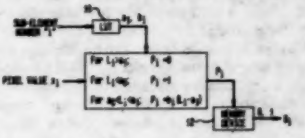
scanning information data, interrogating information data by a movable interrogating element, forming a main flow of impulses coresponding to the data which have been interrogated by said interrogating element, moving said interrogating element successively in directions selected in response to said impulses from more that two directions with an equal probability, and upon reaching by said interrogating element a limit of an information field displacing said interrogating element back into the information field in a jump-like manner to random point.

4,945,422

FALSE DENSITY CONTOUR SUPPRESSION USING STORED RANDOM PROBABILITIES TO FORM PRINT/NO-PRINT DECISIONS

Yee S. Ng, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1990, Ser. No. 459,497
Int. Cl.[5] H04N *1/23, 1/40*
U.S. Cl. 358—298 **7 Claims**



1. Apparatus for suppressing false density contours in halftone reproduction of continuous tone original images which have been converted to a series of discrete picture element signals, said apparatus comprising:

means for selectively printing sub-elements sequentially organized into halftone cells;

means for assigning to each sequential sub-element of a halftone cell a weighted probability of being "ON" in accordance with the value of an associated picture element signal; and

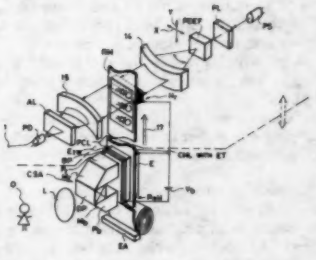
means for converting the weighted probability of each sub-element into a print/no-print decision, said converting means including (1) memory means having a plurality of rows, wherein each row represents a different probability that a sub-element will be "ON", and (2) means for accessing different rows of said memory means on the basis of the weighted probability of a sub-element being "ON".

4,945,423

REPRODUCING APPARATUS FOR CHARGE LATENT IMAGE RECORDING MEDIUM

Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga; Tsutou Asakura, both of Yokohama; Masato Furuya, and Hiromichi Tai, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 301,324, Jan. 24, 1989, which is a continuation-in-part of Ser. No. 139,005, Dec. 29, 1987, Pat. No. 4,831,452. This application Aug. 21, 1989, Ser. No. 396,203
Claims priority, application Japan, Aug. 19, 1988, 63-205771; Sep. 30, 1988, 63-248091
Int. Cl.[5] H04N *1/29, 5/74, 5/80, 5/84;* G01D *15/06*
U.S. Cl. 358—300 **25 Claims**



1. A reproducing apparatus for a charge latent image recording medium comprising:

an electromagnetic radiation source,

an optical system for leading an electromagnetic radiation ray emitted from said electromagnetic radiation source in a direction toward a recording medium on which an object information to be read is prerecorded as a charge latent image, and

a read head arranged closely facing to said recording medium and arranged in series in a travelling path of said electromagnetic radiation ray,

said read head being of a multilayer structure comprising a support base plate, a photo modulation material layer for generating a mode modulation of said electromagnetic radiation ray which passes the photo modulation material layer therethrough in response to intensity of an electric field by said charge latent image, and an electrode for applying a predetermined electric field to said photo modulation layer, and for allowing to receive the electromagnetic radiation ray in a read wavelength range and transmit thereof to said photo modulation layer, an output surface facing to a process means for emitting thereto the electromagnetic ray having passed through the electrode and the photo modulation layer,

said process means processing the electromagnetic ray modulated by going through the photo modulation material layer and outputted from the output surface.

4,945,424

POWER SWITCHING ARRANGEMENT FOR VIDEO CAMERA APPARATUS

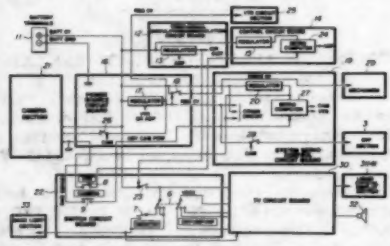
Keiichiro Hiroki, Tachikawa; Yukihiko Fukasawa, Kawasaki, and Ken Yamauchi, Tokyo, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 305,282

Claims priority, application Japan, Feb. 10, 1988, 63-16898[U]

Int. Cl.[5] H04N 5/76

U.S. Cl. 358—335 **15 Claims**



1. A video camera apparatus having an image pick up equipment with an electronic view finder, a video recording and/or reproducing equipment with a television tuner, and a display equipment, the apparatus comprising:

a first on-off switch provided on said image pick-up equipment; a second on-off switch provided on said video recording and/or reproducing equipment;

a third on-off switch provided on said display equipment;

a selecting switch for selecting a television tuner or an external input;

means for causing said electronic view, finder to operate and said display equipment to turn off, when said first on-off switch is turned on and said second on-off switch is turned off;

means for causing said electronic view finder to turn off, when said first on-off switch is turned off and said second on-off switch is turned on and for causing said display equipment to operate, when said television tuner is selected by said selecting switch, and for causing said display equipment to operate or turn off in dependance on a manipulation of said third switch, when said external input is selected by said selecting switch; and

means for causing said electronic view finder to operate when said first and second on-off switches are turned on, and for causing said display equipment to operate when said television tuner is selected by said selecting switch, and for causing said display equipment to operate or turn off in dependance on a manipulation of said third switch, when said external input is selected by said selecting switch.

4,945,425

METHOD AND AN APPARATUS FOR CONTROLLING A VIDEO CASSETTE RECORDER

Mark C. Hahn, Los Gatos, Calif., assignor to Videonics Incorporated, Campbell, Calif.

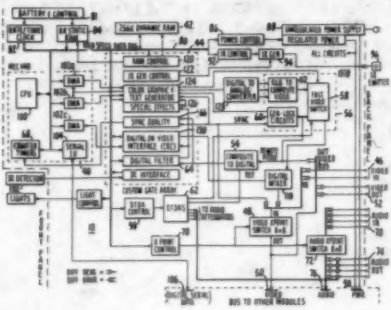
Filed Mar. 30, 1987, Ser. No. 32,371

Int. Cl.[5] G11B 5/86

U.S. Cl. 360—15 **12 Claims**

MICROFICHE APPENDIX INCLUDED

(3 Microfiche, 231 Pages)



1. A method for assembling, editing and producing a production video cassette from a source video cassette having source video information recorded thereon recorded in a plurality of video fields with each field having a plurality of sync signals, but without any timing signals, indicating the number video fields from a particular location, said method comprising the steps of:

(a) locating the beginning of the video information of said source cassette;

(b) playing back said source video information, while simultaneously

(i) copying said source video information onto a dub cassette;

(ii) generating a timing signal on said dub cassette;

(iii) detecting video information from said source cassette near the beginning thereof and determining the starting point in said source video cassette by noting a number of video fields having a selected amount of change in video information (hereinafter: "a recognizable number of video fields");

(iv) counting the number of video fields from said recognizable number of video fields and recording said number in said dub cassette;

(v) detecting the absence of sync signals of each field of video information from said source cassette (hereinafter: "sync signals of poor quality") and noting the location thereof by the count of the number of video fields determined from step (b) (iv);

(c) assembling and editing said dub cassette by tracking the location of desired video scene by the timing signal associated therewith;

(d) rewinding said source cassette; and

(e) playing said video information from said source cassette starting from said recognizable number of video fields; while simultaneously

(i) counting the number of video fields from said recognizable number of video fields;

(ii) correcting the count of the number of video fields from said recognizable number of fields as determined from step e(i), in the event of detection of occurence of sync signals of poor quality; and

(iii) copying said video information onto a production cassette, when said number of video fields reaches a level that corresponds to the location of desired video scene.

4,945,426

HELICAL SCAN TRACKING SYSTEM

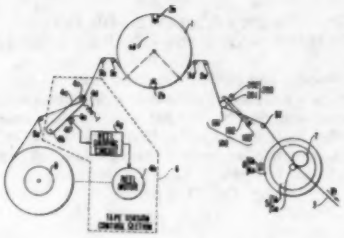
Hiroshi Okamoto, Nara, and Souichirou Fujioka, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 31, 1988, Ser. No. 200,373

Claims priority, application Japan, May 29, 1987, 62-135247

Int. Cl.[5] G11B *5/52, 15/467*

U.S. Cl. 360—70 **5 Claims**



1. A tracking system for a helical scanning type recording-/reproducing apparatus in which a rotating magnetic head arranged on a rotating drum scans over a magnetic tape for an angle θ_w every time the rotating drum rotates θ_p, where $\theta_2 < \theta_p$, so as to record and reproduce signals, comprising:

a tension control means which controls the tension of said magnetic tape;

a tape transfer means which transfers said magnetic tape in its longitudinal direction;

a transfer amount detection means which detects a transfer amount in the longitudinal direction of said magnetic tape;

a tracking error detection means which detects a positional error of the scanning position of said magnetic head with respect to a recorded track formed on said magnetic tape from the signal reproduced by said rotating magnetic head and outputs a tracking error signal; and

a control means which controls said tape transfer means according to the tracking error signal so that said rotating magnetic head scans over the recorded track during a first period in which said rotating magnetic head reproduces the signal recorded on said magnetic tape, and controls said tape transfer means by an output of said transfer amount detection means so that the transfer amount of said magnetic tape becomes a specified amount every time said rotating magnetic head rotates θ_p during a second period other than said first period.

4,945,427

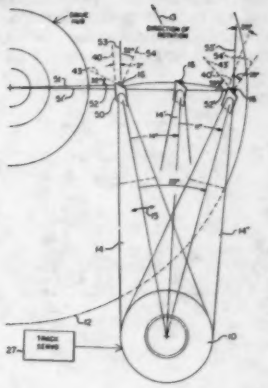
MAGNETIC DISK RECORDING WITH VARIABLE TRACK WIDTH AND VARIABLE TRACK DENSITY

Earl A. Cunningham, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1988, Ser. No. 206,076

Int. Cl.[5] G11B *21/21, 20/20*

U.S. Cl. 360—75 **9 Claims**



7. Disk drive apparatus, comprising; a recording disk and means for rotating said disk, head

means having a generally linear transducing gap,

movable means mounting said head, said movable means being movable between an inner track and an outer track of said disk in a manner to cause said head gap to be skewed to a radius of the disk at each of said tracks, said skew continuously varying in the same sense as said head moves from said inner track to said outer track, so as to cause tracks to be recorded of continuously reducing track width from said inner track to said outer track,

servo means controlling movement of said movable means in a manner to move said head a continuously reduced distance between adjacent tracks, as said head moves from said inner track to said outer track, and

said head being a flying head having a generally parallelogram shaped slider having oblique and acute internal angles, said slider having a plurality of parallel flying rails whose leading ends terminate in a generally linear leading slider edge, the outer corner of said leading edge being located so as to lead the inner corner of said leading edge, as said corners are viewed from said disk.

4,945,428

METHOD OF MANAGING A MEDIA LIBRARY

Ellen J. Waldo, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1988, Ser. No. 190,738

Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—92 **2 Claims**

1. In a machine-effected method of operating a media library having a large plurality of storage slots, each capable of storing a record medium, a plurality of media drives in the library capable of receiving and yielding a record medium for performing signal transfer operations on the medium while in the drive, carrier means moveable amongst all of said slots and drives for carrying record media therebetween, the carrier being capable of holding and carrying a plurality of said media; the machine-executed steps of:

assigning a unique VOLSER to each of said record media;

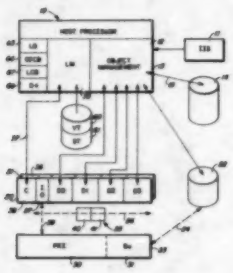
creating a retentively stored volume table identifying all record media in the library by the respective VOLSERs

and indicating that the volume table the location in the library of each record medium by its respective VOLSER;

creating a volatile library control block for the library indicating which of said record media are in the carrier and slots by the respective VOLSERs;

positioning the carrier at one of said slots or said drives, at said one slot or drive, first fetching a record medium whenever such slot or drive currently is holding a one of said record media and then inserting another record medium from the carrier into said one slot or drive;

contemporaneously to said fetching, inserting and carrying maintaining a working and a retentive copy of information



identifying the record media being carried by the carrier, stored in the slots and being held by the respective drives; and

when finished with a first record medium held in a given drive, leaving such record medium in the drive until a second record medium is to be mounted into the given drive and then in one carrier motion remove the first record medium from the drive and then inserting the second record medium into the given drive and then storing the first record medium in an empty one of said slots which is a closest one of the slots to the given drive irrespective of the slot from which the first record medium from for mounting into the given drive.

4,945,429

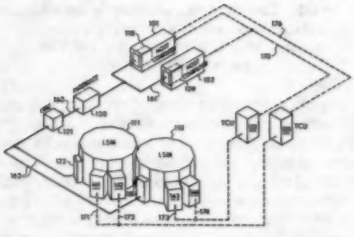
DATA SECURITY ARRANGEMENT FOR AN AUTOMATED MAGNETIC TAPE CARTRIDGE LIBRARY SYSTEM

Frederick G. Munro, Broomfield; Kelly J. Beavers, Boulder; Ronald W. Korngiebel; Raymond L. Lucchesi, both of Broomfield, and Michael E. Moy, Lafayette, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jan. 27, 1988, Ser. No. 148,599

Int. Cl.[5] G11B *17/22, 21/08*

U.S. Cl. 360—92 **15 Claims**



1. In a data processing system which includes a host computer connected to a plurality of information storage volume read/write devices and also connected to an automated library system, which includes two or more interconnected library modules, each of which stores information storage volumes for retrieval and placement into ones of said information storage volume read/write devices, an information storage volume security arrangement to permit data retrieval by said host computer from a selected information storage volume located in said automated library system without human access to said information storage volume comprising:

means responsive to a request from a user on said host computer for a data file stored on one of said information storage volumes for translating said data file request into an identification of the information storage volume that contains said requested data file;

means for converting said information storage volume identification to a definition of a physical location in said automated library system of said identified information storage volume;

means responsive to said definition for selecting one of said information storage volume read/write devices to read/write said requested information storage volume;

means responsive to said selecting means for robotically transporting said identified information storage volume from said identified location to said selected information storage volume read/write device;

means for performing an information storage volume audit, to determine if each information storage volume in said automated library system in located in its assigned information storage cell.

4,945,430

CARRIER APPARATUS FOR TAKING INFORMATION-STORAGE REGULAR ARTICLES IN AND OUT

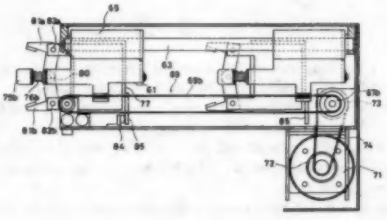
Masao Konishi, and Shigeki Tsuchida, both of Osaka, Japan, assignors to Kabushiki Kaisha Itoki Kosakusho, Osaka, Japan

Continuation of Ser. No. 159,591, Feb. 16, 1988, abandoned. This application Apr. 18, 1989, Ser. No. 339,897

Claims priority, application Japan, Jun. 16, 1986, 61-92246[U]; Jun. 16, 1986, 61-92247[U]

Int. Cl.[5] G11B *15/68, 23/12*

U.S. Cl. 360—92 **11 Claims**



1. An apparatus for placing information-storage regular articles at selected aligned positions aligned vertically and transversely within a predetermined depth inside a housing that has front and back portions and for transferring the articles between said aligned positions and an information reading means, comprising:

information reading means for reading information from said articles, having a greater depth with respect to a front-to-back direction within the housing than is required for said aligned positions and located at a lower portion of the housing to be in a predetermined alignment with respect to said aligned positions and adjacent to said front portion of said housing so that a space is defined between said aligned positions of said articles within said housing and said back portion of said housing and above said information reading means;

a picker movable between said front portion of said housing

and said aligned positions for taking said articles in and out of said aligned positions and to and from the information reading means;

a picker support member having two ends, horizontally provided between said front portion of said housing and said aligned positions, for movably supporting thereon said picker;

an elevation mechanism for raising and lowering said picker support member, said elevation mechanism comprising a pull-driving portion arranged in said space; and

strings suspending both end portions of said picker support member and guided to said pull-driving portion through string guide members located in an upper part of the housing, said pull-driving portion pulling/loosening said strings to raise/lower said picker support member together with said picker supported thereon.

4,945,431

MAGNETIC TAPE CASSETTE DEVICE TO LIMIT MOVEMENT OF THE CASSETTE

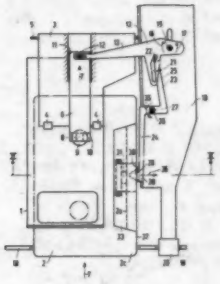
Norbert Kunze, Ehringshausen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1988, Ser. No. 194,764

Claims priority, application Fed. Rep. of Germany, May 25, 1987, 3717587; May 25, 1987, 3717599

Int. Cl.[5] G11B *15/00*

U.S. Cl. 360—96.5 **17 Claims**



1. A magnetic tape cassette device, comprising:

a cassette tray for receiving a magnetic tape cassette with a clearance fit;

means for mounting said tray for movement between a rest position in which a cassette can be inserted in said tray and a play position;

a pivotable operating lever coupled to say tray, said operating lever pivoting during movement of said tray between said rest and play positions;

a tappet lever having a tappet end and an opposing end, said tappet lever being mounted for movement of said tappet end against a cassette received in said tray, said tappet end having a sloped surface angled with respect to a wall of said cassette; and

coupling means for directly coupling said opposing end of said tappet lever to said operating lever for biasing said sloped surface against a cassette wall and urging the cassette against said tray when said tray is in said rest position and for withdrawing said tappet from said cassette when say tray is moved from said rest position.

4,945,432

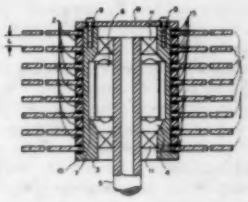
MAGNETIC DISK DRIVE WITH BRITTLE DISKS

Takeo Matsudaira, Cupertino; Hiroshi Kouno, Sunnyvale, both of Calif.; Shinji Eda, Yamanashi, and Juuzoh Funayama, Kanagawa, both of Japan, assignors to Hoya Electronics Corporation, San Jose, Calif.

Filed Mar. 31, 1988, Ser. No. 175,510

Int. Cl.[5] G11B *5/012*

U.S. Cl. 360—98.02 **30 Claims**



1. A magnetic disk drive comprising

rotatably around a fixed axis, a spindle disposed rotatably around a fixed axis, said spindle having an external peripheral surface and a rim formed at a lower position on said peripheral surface,

a plurality of magnetic disks disposed engagingly around said spindle and in layers on said rim, and

a plurality of spacers disposed between said magnetic disks and keeping said magnetic disks mutually at a fixed distance,

said magnetic disk drive being characterized wherein

said magnetic disks each comprise a substrate made of a brittle non-metallic material and

said substrates and said spacers are attached together by an adhesive and form a unistructural assembly.

4,945,433

EJECTING MECHANISM OF DISK CARTRIDGES

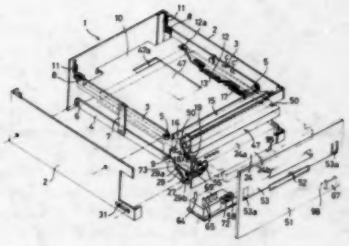
Masayuki Suzuki, Tokyo, and Hirokimi Iwata, Ibaragi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,618

Claims priority, application Japan, Sep. 21, 1987, 62-236954

Int. Cl.[5] G11B *5/012, 17/022*

U.S. Cl. 360—99.07 **11 Claims**



1. An ejecting mechanism for disk cartridges comprising:

a cartridge holder movable between a raised position where a disk cartridge is inserted in and ejected from said cartridge holder through a cartridge insertion opening provided in a panel surrounding said ejecting mechanism, and a lowered position where a disk accommodated in said disk cartridge is mounted on a turntable;

an operating lever movable in the same direction as said disk

cartridge is inserted and ejected, so as to raise and lower said cartridge holder;

a driving member driven by a motor and engaged with said operating lever to move said operating lever;

a disengaging member secured to said operating lever for disengaging said operating lever from said driving member;

a locking member for locking said disk cartridge inserted in said cartridge holder;

a releasing lever for unlocking said disk cartridge which has been locked by said locking lever; and

means, when said operating lever is moved to a second position where said cartridge holder is in said lowered position thereof, for manually actuating said disengaging member by a pushing operation from a front side of said panel to disengage said operating lever from said driving member and in succession, for moving said operating lever by said pushing operation to a first position where said cartridge holder reaches said raised position and further, just before said cartridge holder reaches said raised position, for driving said releasing lever so as to unlock said disk cartridge which has been locked by said locking member.

4,945,434

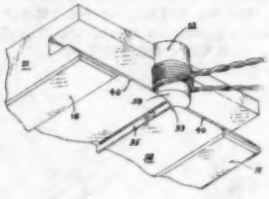
MAGNETIC RECORDING HEAD EMPLOYING AN I-BAR CORE STRUCTURE

Richard C. Wilmer, Campbell, Calif., and Joseph T. Di Bene, South Lake Tahoe, Nev., assignors to Maxtor Corporation, San Jose, Calif.

Filed Dec. 5, 1988, Ser. No. 280,029

Int. Cl.[5] G11B *17/32*

U.S. Cl. 360—103 **13 Claims**



1. A magnetic recording head for rigid-disk recording comprising:

a slider body having a flat air-bearing bottom surface, a top surface and a slot located across a side of said slider body;

a straight core member having an inner surface attached co-planar to said side and positioned over said slot substantially perpendicular to said bottom surface, said core member with a substantially rounded outer surface, and a tapered pole tip which forms a gap with a portion of said slider body;

a wire coil wrapped around said pole body including a portion of said rounded outer surface to thereby reduce wear on the wire, said coil extending into said slot for inducing magnetic flux across said gap during write operations and for sensing magnetic flux emanating from the disk surface during readback operations.

4,945,435

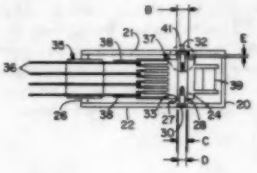
NONINFLUENCING FASTENER FOR DISK DRIVES

Jeffrey F. Boigenzahn; Darrell E. Bratvold; James M. Rigotti, all of Rochester, and Lyle R. Tufty, Elgin, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1989, Ser. No. 303,792

Int. Cl.[5] G11B *5/55*

U.S. Cl. 360—106 **8 Claims**



1. A rigid disk drive having a box frame within which a disk spindle assembly and a rotary actuator are mounted, said actuator being rotatably mounted about a shaft secured to substantially parallel walls of said box frame by connection means comprising

first securing means securing one end of said shaft to one of said substantially parallel walls;

a surface defining an opening in the other of said substantially parallel walls; and

second securing means at said other substantially parallel wall including a deformable washer disposed in said wall opening and compressive retaining means connected to said shaft which compresses and deforms said deformable washer into contact with said wall surface defining an opening, whereby said shaft is retained at the end opposite said one end to said substantially parallel wall without applying a force that urges said substantially parallel wall portions toward or away from one another.

4,945,436

DOUBLE-SIDED RECORDING METHOD USING SLANTED GUIDE PLATES UPSTREAM AND DOWNSTREAM OF RECORDING HEADS

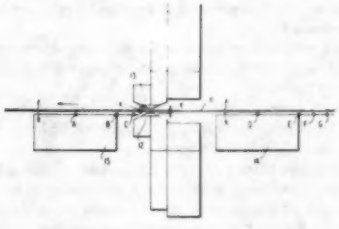
Yasuo Nagashima, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 21, 1988, Ser. No. 222,667

Claims priority, application Japan, Jul. 27, 1987, 62-185586; Jul. 27, 1987, 62-185587

Int. Cl.[5] G11B *15/60*

U.S. Cl. 360—104 **9 Claims**



1. A double-sided recording method comprising the following steps:

disposing first and second magnetic heads opposed to each other on opposite sides of a rotating flexible magnetic disk; and

placing first and second guide plates at an upstream and

downstream side, respectively, of said first or second magnetic head, said guide plates being adjustably slanted toward a surface of said flexible magnetic disc head to apply negative or positive pressure to said flexible magnetic disk and to cause said flexible magnetic disk to be attracted or urged to said first or second magnetic head.

4,945,437

MAGNETIC HEAD MECHANISM FOR REVERSING HEAD ORIENTATION AND MOVING HEAD IN TAPE WIDTH DIRECTION

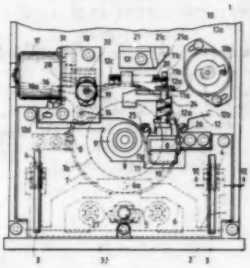
Yuzo Oguchi; Fumito Komatsu, and Motokiro Iizawa, all of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiko Seisakusho, Nagano, Japan

Filed Sep. 12, 1988, Ser. No. 243,536

Claims priority, application Japan, Sep. 11, 1987, 62-227940; Sep. 30, 1987, 62-246928; Sep. 30, 1987, 62-246929; Sep. 30, 1987, 62-246930

Int. Cl.[5] G11B *5/55, 21/08*

U.S. Cl. 360—106 **11 Claims**



1. In a magnetic head mechanism in a magnetic tape apparatus capable of multiple track, two-way recording and reproduction on a magnetic tape having a plurality of parallel longitudinal tracks, the improvement comprising means for supporting a magnetic head in such a way that it is reversible by 180° in orientation around an axis that is perpendicular to the surface of the head over which the magnetic tape slides to allow two-way recording and reproduction on the magnetic tape, and means for moving said magnetic head across the width of said magnetic tape to effect track interchange.

4,945,438

COMBINED MAGNETIC HEAD

Takashi Matsumoto, and Taichi Takesa, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1988, Ser. No. 185,663

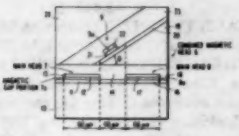
Claims priority, application Japan, Apr. 24, 1987, 62-100114; Apr. 24, 1987, 62-100115

Int. Cl.[5] G11B *5/29*

U.S. Cl. 360—121 **6 Claims**

1. A combined magnetic head comprising:

two main heads for forming main tracks on a recording medium, said main heads being separated from each other in a width direction of said main tracks of said recording medium by a predetermined distance; and



a data head fixed to said main heads and having a width in said width direction of between 2/5 to 3/5 of said predetermined distance.

4,945,439

SYNC CROSSTALK CANCELLING CIRCUIT

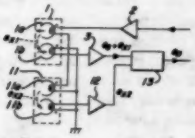
Shigemi Sato, Tokyo, Japan, assignor to Fostex Corporation of Japan, Tokyo, Japan

Continuation of Ser. No. 153,244, Feb. 8, 1988, abandoned. This application Jul. 25, 1989, Ser. No. 388,295

Claims priority, application Japan, Apr. 27, 1987, 62-103612

Int. Cl.[5] G11B *5/12*

U.S. Cl. 360—124 **8 Claims**



1. In a multi-track recording system for sync recording and ping-pong recording on a magnetic medium, said system having a multiplicity of parallel recording channels with one transducer per recording channel, selectively functioning as either a record or playback head, the improvement comprising circuitry for eliminating the effect of crosstalk in the playback signal between a selected pair of record and playback transducers, said circuitry comprising:

a first record transducer and a first playback transducer located on proximate tracks of said magnetic medium for recording signals on one track of said medium and playing back signals recorded on another track of said medium;

a second record transducer and a second playback transducer of like construction to said first record and playback transducer located adjacent to each other and away from said first record and playback transducers and said magnetic recording medium, said second record transducer being connected in series to said first record transducer;

means for driving the first and second record transducers with the signal to be recorded on the magnetic medium;

means for playing back the recorded and crosstalk signals detected by the first playback transducer;

means for playing back the crosstalk signals detected by the second playback transducer in reverse polarity to the signal playing back from the first playback transducer; and

means for combining the playback signals from the first and second playback transducers whereby the reverse polarity

crosstalk signal from the second playback transducer cancels out the crosstalk signal from the first playback transducer.

4,945,440

TAPE CASSETTE WITH TRANSPARENT REEL VIEWING WINDOWS AND LAMINATED THREE-COLOR CONSTRUCTION

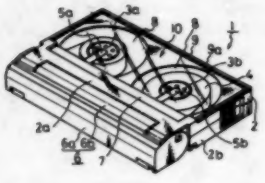
Yuji Iwahashi; Kiyoshi Urayama, and Shinya Sato, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 19, 1988, Ser. No. 195,876

Claims priority, application Japan, Sep. 29, 1987, 62-84196[U]

Int. Cl.[5] G11B *23/08*

U.S. Cl. 360—132 **1 Claim**



1. A tape cassette comprising:

a housing consisting of an upper half and a lower half,

said upper half being composed mainly of an opaque material,

said upper half having a through-hole window portion without any material on the upper wall thereof,

a cover portion laminated on the part of outside surface of said upper half, said cover portion being composed of a transparent material, said window portion being filled up by a single layer of said transparent material, an additional portion of said upper half surrounding the periphery of said window portion and being formed of a double layer of said transparent material on the outside surface of said opaque material, and a remaining portion of said upper half being formed by single layer of said opaque material, whereby said opaque material in said additional portion can be seen through said transparent material; and wherein said cover portion has a raised peripheral edge to prevent scratching of said cover portion by lateral forces.

4,945,441

ZERO-CROSS POINT DETECTING CIRCUIT

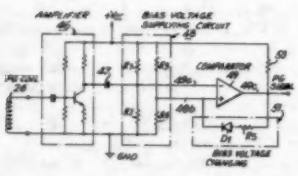
Kiyotaka Kaneko, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1988, Ser. No. 193,955

Claims priority, application Japan, Aug. 17, 1984, 59-171345

Int. Cl.[5] G11B *00/00*

U.S. Cl. 360—137 **5 Claims**



1. A zero-cross point detecting circuit for use in a magnetic recording and/or reproducing apparatus of which the recording medium is a rotating magnetic disk and which has means for generating a signal having a zero-cross point corresponding to a reference point set on said magnetic disk for indicating its rotational phase, said detecting circuit being responsive to said generated signal and comprising:

an operational amplifier having a first inverted input terminal, a second non-inverted input terminal and a third output terminal;

a comparator having a first inverted input terminal, a second non-inverted input terminal and a third output terminal, the third terminal of the comparator being either at a high level or a low level;

a resister connected between the first and third terminals of the amplifier to form therewith a voltage added circuit;

means to apply said generated signal between the first and second terminals of the amplifier;

a bias voltage supplying circuit coupled between the second terminal of the amplifier and one of the first and second terminals of the comparator to apply the same bias voltage thereto;

means connecting the third terminal of the amplifier to the other of the first and second terminals of the comparator; and

a bias voltage changing circuit coupled between the third output of the comparator and the first terminal of the amplifier to apply a voltage to the voltage adder circuit which depends upon the level at the third terminal of the comparator.

4,945,442

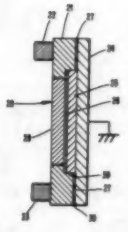
PROTECTIVE CIRCUITRY FOR HIGH-ENERGY TRANSIENTS

Arthur E. Brockschmidt, Jr., Renton, and Richard J. Jameson, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 302,994, Jan. 30, 1989, abandoned, which is a continuation of Ser. No. 19,516, Feb. 26, 1987, abandoned. This application Nov. 6, 1989, Ser. No. 432,339

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—56 **39 Claims**



1. A circuit for terminating a DC arc across a spark gap, comprising:

an electrical DC power line including a pair of conductors for providing a DC voltage;

a pair of spaced electrodes connected to the pair of conductors and forming a spark gap, being operative to pass an arc between the electrodes at times when the sum of a high-energy transient and the DC voltage on the DC power line exceeds a predetermined value; and

means for accelerating termination of a DC arc passing between the electrodes after the sum of the high-energy transient and the DC voltage on the DC power line is reduced below the predetermined value, the termination means including

a low impedance capacitor for accelerating termination of the DC arc, and

a low impedance pair of leads, connected to the pair of spaced electrodes and to the low impedance capacitor and having a preselected length and cross-sectional area, for providing a low impedance connection be-

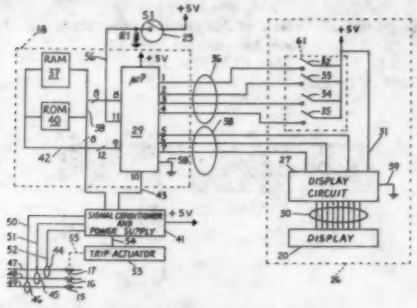
tween the pair of spaced electrodes and the low impedance capacitor.

4,945,443

ELECTRONIC CIRCUIT INTERRUPTER WITH COMBINED KEYPAD AND DISPLAY

Mark S. DeBiasi, Windsor; Robert J. Danek, Andover; Hanns P. Sailer, Plainville; Ira B. Goldman, Waterbury, and David J. Lesslie, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 14, 1989, Ser. No. 407,503
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—93 **12 Claims**



1. An electronic circuit interrupter comprising:

a plastic case and a plastic cover;

a pair of separable contacts within said case arranged for automatic separation upon occurrence of an overcurrent condition through said contacts;

an electronic trip unit within said cover and electrically connected with an associated electric power distribution circuit, said electronic trip unit including a microprocessor and memory storage elements containing fixed set point parameters;

a keypad and display unit within a recess formed within said cover, said keypad and display unit being interlocked with said microprocessor by means of a sealing wire passing through said keypad and display unit and said cover; and

a power supply connected with said microprocessor through a disconnect switch, said disconnect switch being held in a closed position by means of a sealing wire passing through said cover and said keypad and display unit whereby removal of said wire opens said disconnect switch to provide a logic signal to said microprocessor.

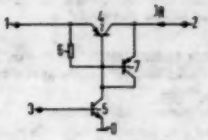
4,945,444

INTEGRATABLE CIRCUIT CONFIGURATION FOR REVERSE CURRENT REDUCTION IN AN INVERSELY OPERATED TRANSISTOR

Frank-Lothar Schwertlein, Munich, and Michael Lenz, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 455,553
Claims priority, application European Pat. Off., Dec. 21, 1988, 88121417.5
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—101 **8 Claims**

1. Integratable circuit configuration, comprising a first transistor of one conduction type having an emitter being acted upon by a first potential, a collector being acted upon by a second potential, a base, a base-to-collector path and a base-to-emitter path, a resistor connected in parallel with the base-to-emitter path of said first transistor, a second transistor of the other conduction type being connected to the base of said first transistor for triggering, and a diode connected in parallel with the base-to-collector path of said first transistor, said diode



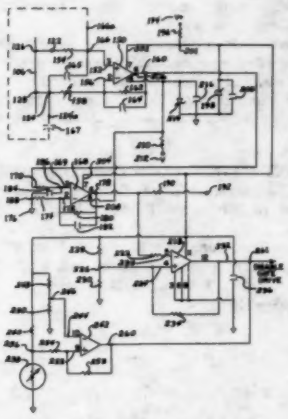
conducting in inverse operation for reverse current reduction during inverse operation of said first transistor.

4,945,445

CURRENT SENSE CIRCUIT

Richard F. Schmerda, Milwaukee; John A. Dombeck, Glendale, both of Wis., and Lance R. Kaufman, Paradise Valley, Ariz., assignors to Gentron Corporation, Milwaukee, Wis.

Filed Sep. 29, 1988, Ser. No. 251,671
Int. Cl.[5] H02H *3/08*
U.S. Cl. 361—101 **3 Claims**



1. A current sense circuit comprising:

a semiconductor switch comprising a semiconductor chip having a pair of main terminal metallization contact pads, a conductor jumper bond wire directly connected to one of said pads, a control terminal metallization contact pad with a conductor jumper bond wire directly connected thereto for controlling the conduction state of said semiconductor switch between an ON state passing current between said main contact pads, and an OFF state blocking current flow between said main contact pads;

control drive circuitry connected to said second mentioned bond wire and having an enabled state supplying a drive signal to said semiconductor switch driving the latter into said ON state;

amplifier means having first and second inputs connected to said first mentioned bond wire at spaced points therealong and sensing current flow through said first bond wire by sensing voltage between said spaced points and amplifying said voltage;

comparator means comparing said amplified voltage against a reference voltage and generating an output signal when said amplified voltage exceeds said reference voltage by a given amount;

disabling means responsive to said output signal from said comparator means and disabling said control drive cir-

cuitry from supplying said drive signal to said semiconductor switch,

wherein said amplifier means comprises:

a first amplifier having first and second inputs and an output;

a first resistor connected between said first bond wire at one of said spaced points and said first input of said first amplifier;

a second resistor connected between said first bond wire at the other of said spaced points and said second input of said first amplifier;

a third resistor connected between said output of said first amplifier and said second input of said first amplifier;

a first capacitor connected between said first and second resistors;

a second capacitor connected between said output of said first amplifier and said second input of said first amplifier;

a second amplifier having first and second inputs and an output;

a fourth resistor connected between said output of said first amplifier and said first input of said second amplifier;

a fifth resistor connected between a reference point and said second input of said second amplifier;

a sixth resistor connected between said output of said second amplifier and said second input of said second amplifier;

a third capacitor connected between said fourth and fifth resistors;

a fourth capacitor connected between said output of said second amplifier and said second input of said second amplifier;

and wherein said comparator means comprises a comparator having a first input connected to said output of said second amplifier, and a second input supplied by said reference voltage, and an output supplying said output signal.

4,945,446

MAGNETIC FIELD COMPENSATING APPARATUS

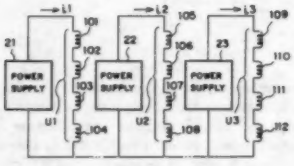
Shigenori Kuroda, and Moriaki Takechi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 209,971

Claims priority, application Japan, Jun. 23, 1987, 62-154568

Int. Cl.[5] H01H *47/00*

U.S. Cl. 361—146 **6 Claims**



1. A magnetic field compensating apparatus for compensating error magnetic fields in the radial direction of a magnet apparatus used for a magnetic resonance apparatus comprising:

a plurality of compensating units comprising a plurality of serial coils each of which is disposed concentrically along a main magnetic field and symmetrically with regard to a plane perpendicular to said main magnetic field,

a plurality of power sources which separately supply currents to these compensating units,

and made in such a manner that a plurality of components among said error magnetic fields in the radial direction are contained in each of said compensating units, a plurality of said components are compensated by the whole of a plurality of said compensating units, and, at the same time, each of said currents supplied to said compensating units is decided in accordance with a constitution of each of said compensating units, said plurality of said compensating units comprising a first compensating unit composed of four saddle-shaped coils disposed cylindrically, a second compensating unit composed of four saddle-shaped coils disposed cylindrically pair by pair on both sides of the first compensating unit, and a third compensating unit composed of four saddle-shaped coils piled and disposed concentrically on each of said saddle-shaped coils of said first compensating unit.

4,945,447

ELECTROSTATIC GROUNDING SYSTEM FOR WORK SURFACES

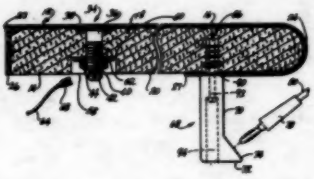
Harold K. Aronson, 10615 Daines Dr., Temple City, Calif. 91780

Division of Ser. No. 891,206, Jul. 28, 1987, Pat. No. 4,802,056, which is a continuation-in-part of Ser. No. 844,708, Mar. 27, 1986, abandoned. This application Jan. 31, 1989, Ser. No. 304,169

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[5] H05F *3/02*

U.S. Cl. 361—212 **5 Claims**



1. A grounded work station comprising:

a work surface including a laminate covering having an outer layer over an inner conductive layer;

means for grounding said inner layer to ground static electric charges, said grounding means including a conductive plug disposed in said work surface, the plug having a head adapted to be drawn against said covering, the head having a tapered circumference disposed in an intimate electrical conductive relationship with the conductive layer;

means for electrically grounding the plug to thereby ground the work surface;

a fixture attached to the work station, said fixture being connected in an electrically conductive relationship with said conductive layer, the fixture including connecting means to receive a grounding cable.

4,945,448

MEMORY CARTRIDGE FOR A CIRCUIT BOARD MODULE

Edwin L. Bremenour, Euclid; Michael F. Tratar, and Gerald S. Pepera, both of Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Mar. 17, 1989, Ser. No. 325,220

Int. Cl.[5] H05K *7/20, 1/14*

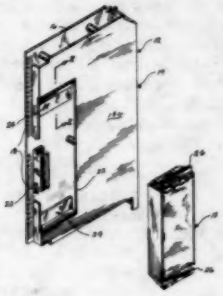
U.S. Cl. 361—383 **10 Claims**

1. A housing for a circuit cartridge, of the type including a circuit board carrying electrical circuitry and an electrical connector on one side of the circuit board, for connection to a main circuit board module having a cover with a main panel and with spaced, opposed mounting flanges extending towards one another and generally parallel to the main panel, wherein:

the housing extends in a longitudinal direction along the plane of the circuit board between two opposite ends and extends in the transverse direction perpendicular to the longitudinal direction and parallel to the plane of the circuit board; and

wherein the housing includes a pair of clip members at the opposite ends of the housing, the clip members each including means for receiving and seating a respective mounting flange transversely extending across the ends of the housing, wherein the means for receiving and seating

are located on the clip members to control depth of insertion, at least one clip member being yieldable in the longitudinal direction to allow insertion of the cartridge along



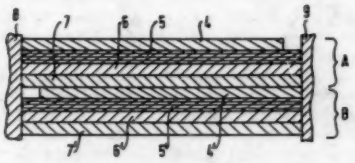
its length and through an opening on the main circuit board module to the controlled depth of insertion, where the mounting flanges are seated in the clip member to secure the cartridge therebetween.

4,945,449

HIGH VOLTAGE CAPACITOR WITH HIGH ENERGY DENSITY

Albert Canseli, and Mihail Raduleanu, both of Wissembourg, France, assignors to Atesys, Wissembourg, France

Continuation-in-part of Ser. No. 783,199, Oct. 2, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 75,615
Claims priority, application France, Jul. 21, 1986, 86 10652
The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.
Int. Cl.[5] H01G *4/08, 9/00*
U.S. Cl. 361—273 **23 Claims**



2. A regenerating capacitor comprising in combination:
first and second metallic foils; and
a dielectric, including aramide fibers, providing a regenerating capacity, interposed therebetween,
whereby said capacitor is operative at elevated temperatures up to 250° C.

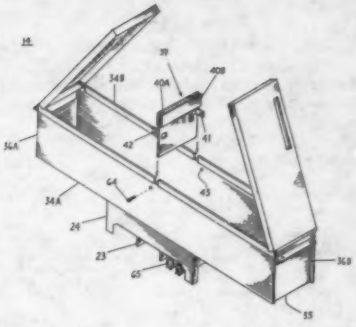
4,945,450

MODULAR ELECTRIC SWITCH-CIRCUIT BREAKER ASSEMBLY

Robert J. Sabatella, Southington; Joseph J. Mrowka; Jon P. McCuin, both of Bristol; Dean A. Robarge, New Britain; Denis A. Perzan, Plainville; Robert G. Markowski, East Haven, and David A. Reid, Forestville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Aug. 2, 1989, Ser. No. 388,467
Int. Cl.[5] H02B *1/04*
U.S. Cl. 361—334 **27 Claims**

1. An electric switch-circuit breaker module comprising in combination:
a pair of opposing sidewalls and endwalls joined by a continuous rear wall defining a rectangular enclosure open at a forward side thereof;
a central partition intermediate and parallel to said endwalls separating said enclosure into first and second compartments;
a pair of corresponding first and second compartment covers each hingeably attached to one of said endwalls;
an insulative base attached to said rear wall and on the outside of said enclosure and communicating with said rear wall by means of an aperature therethrough;



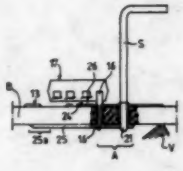
a plurality of connector clips extending from said insulative base, said connector clips each including an inner and outer off-set clip;
an electric switch or circuit breaker within said first compartment, said second compartment being adapted for later receiving a field-installed electric switch or circuit breaker; and
means arranged on said rear wall for attaching said enclosure to an electrically grounded panelboard or switchboard interior and for making electrical ground connection between said enclosure and said panelboard or switchboard interior.

4,945,451

PRINTED CIRCUIT WITH THERMAL DRAIN

Pierre Gobl, La Colle Sur Loup; Raymond Llabres, Saint Laurent Du Var, and Pascal Malgouires, Cannes La Bocca, all of France, assignors to La Telemecanique Electrique, France

Filed Sep. 16, 1988, Ser. No. 254,260
Claims priority, application France, Sep. 16, 1987, 87 12805
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—386 **6 Claims**



1. A printed circuit card carrying at least an electronic component box having connecting clips which are welded on the card, said card presenting a mounting face for the box, a welding face of the box, conducting tracks provided on the mounting face and on the welding face, a first plurality of metallized holes wherein the connecting clips are inserted and welded and a thermal dissipator mounted on the card for dissipating the heat emitted by the box, wherein:
i- a thermal drainage metallic area collecting part of the

heating emitted by the box is constituted by a zone of the welding face located under the box which is covered by a thick layer of soldering metal;

ii- the thermal dissipator is a metallic piece having lugs respectively positioned and welded in a second plurality of metallized holes provided on the card in close vicinity to at least one determined connecting clip of said box, said lugs being also welded on said faces of the card;

iii- the thermal drainage metallic area forms a privileged thermal adduction path between said determined connecting clip and the lugs of the thermal dissipator.

4,945,452

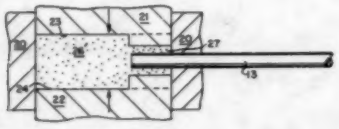
TANTALUM CAPACITOR AND METHOD OF MAKING SAME

John Sturmer, N. Berwick, and John Y. Cadwallader, Saco, both of Me., assignors to AVX Corporation, New York, N.Y.

Filed Nov. 30, 1989, Ser. No. 443,386

Int. Cl.[5] H01G 9/00

U.S. Cl. 361—529 **5 Claims**



3. In a tantalum capacitor comprising a tantalum anode rod, a sintered porous mass of tantalum particles surrounding said anode rod, portions of said mass engaging said rod being non-welding mechanically and electrically coupled to said rod, a dielectric film encompassing the surface area of portions of said mass and a conductive cathode impregnant encompassing said dielectric coating film, the improvement which comprises the density of said mass in substantially the entirety of the regions of said mass in registry with said anode rod being from about 8 to 10 or more grams per cc, the density of the remaining regions of said mass being from about 4 to 7 grams per cc.

4,945,453

VEHICULAR HEADLAMP

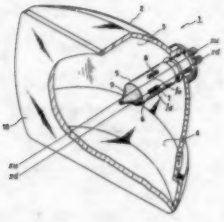
Hiroyuki Serizawa, and Akio Mochizuki, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1989, Ser. No. 392,518

Claims priority, application Japan, Aug. 16, 1988, 63-203561

Int. Cl.[5] F21M 3/30

U.S. Cl. 362—61 **9 Claims**



1. A vehicular headlamp comprising:

a concave light reflector whose opening is shaped generally rectangular, said concave light reflector including upper and lower light reflecting surfaces each being of a paraboloid of revolution, said upper and lower light reflecting surfaces having respective upper and lower rotation axes which extend forward in parallel with each other and having respective focuses which are placed on said axes, said respective focuses being located at respective positions where an imaginary line perpendicular to both the rotation axes intersects the same, said focus of said lower light reflecting surface being located above a horizontal plane which defines a conjunction portion between said upper and lower light reflecting surfaces;

a lens positioned in front of said concave light reflector;

a first light source positioned at the focus of said lower light reflecting surface; and

a second light source positioned just above the focus of said upper light reflecting surface.

4,945,454

REFLECTOR FOR DIMMED OR DIMMABLE MOTOR VEHICLE HEADLIGHTS

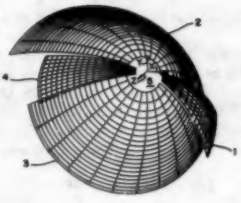
Wolfgang Bunse, Bielefeld; Hans-Otto Ernst, Lippstadt; Heinz Droste, Erwitte; Franz-Josef Kalze, Harsewinkel, and Wolfgang Peitz, Warstein, all of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,826

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808086

Int. Cl.[5] B60Q 1/00

U.S. Cl. 362—61 **19 Claims**



1. A reflector for a dimmed or dimmable motor vehicle headlight, said reflector comprising a reflection surface for producing a beam of light in front of said headlight including an asymmetrical wedge-shaped sector, an upper sector, and a lower sector, the reflection surface being formed such that a desired reflected light distribution is created without a correcting lens, the asymmetrical wedge-shaped sector not having a parabolic shape but being arranged such that a corresponding point of every reflected light-filament image of each arbitrary point of the asymmetrical wedge-shaped sector lies immediately near a light-dark borderline for a prescribed light distribution produced by said reflective surface in front of said headlight, such as a legislatively mandated borderline.

4,945,455

AUTOMOTIVE PROJECTOR-TYPE HEADLAMP

Kunio Akizuki, Shirasakamachi, Japan, assignor to Ichikoh Industries Ltd., Tokyo, Japan

Filed Nov. 30, 1989, Ser. No. 443,400

Claims priority, application Japan, Nov. 30, 1988, 63-300972

Int. Cl.[5] F21V 7/08, 13/04

U.S. Cl. 362—61 **8 Claims**

1. A projector-type headlamp, comprising:

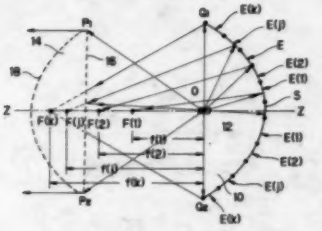
a concave mirror having an inner reflecting surface, an apex and an axjs

a lamp bulb as light source of which a center nearly falls on the axis of said concave mirror; and

a convex lens so disposed as to have an optical axis thereof nearly coincident with the axis of said concave mirror,

the inner reflecting surface of said concave mirror being composed, at an area near the apex, of a central spherical area formed by a part of a spherical surface and having a

center thereof disposed on the axis of said concave mirror and a composite ellipsoidal surface of revolution formed by parts of a plurality of ellipsoidal surfaces of revolution smoothly joined to each other for junction with said central spherical area, having a common focus at the center of



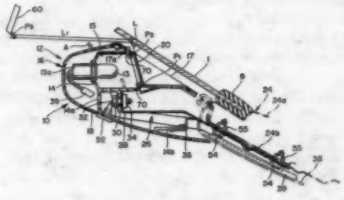
said spherical area and other foci at positions spaced a predetermined distance from said common focus toward said convex lens, said lamp bulb being having the center thereof disposed near said common focus and said convex lens having the focus thereof disposed near said common focus.

4,945,456

HIGH-MOUNTED STOPLIGHT FOR MOTOR VEHICLE

Susumu Kakidaira, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,343
Claims priority, application Japan, Dec. 28, 1987, 62-330006
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—80.1 **8 Claims**



1. A high-mounted stoplight for a motor vehicle, comprising: a body, a front lens attached to an open front of said body; a light source provided in said body, said lens and said one front being located at the center rear of said vehicle inside a rear window thereof and spaced from said window; and means for ensuring that light emitted from said light source, transmitted from the foremost point of said lens and along an upper portion of shade means of said stoplight at the vertical central longitudinal section of said stoplight and reflected by said rear window toward the front of said vehicle does not proceed to a rearview mirror of said vehicle or is not reflected by said mirror toward the eyes of the driver of said vehicle, said ensuring means being spaced from said window.

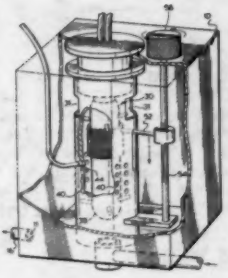
4,945,457

COOL LIGHT SOURCE FOR OPTIC FIBRES

Armand Yazdani, Toronto, and Morris Anidjar, Mississauga, both of Canada, assignors to Nei Canada Limited, Rexdale, Canada

Filed Jan. 23, 1989, Ser. No. 298,923
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 **10 Claims**

1. Transmission source for synthetic optic fibres comprising:
light source contained in a transparent envelope,
sleeve surrounding said envelope,
apertures in said sleeve directed inwardly toward said light source,
synthetic optical fibres projecting through said apertures, to ends spaced from said envelope,
means for causing liquid flow between said fibre ends and said envelope,



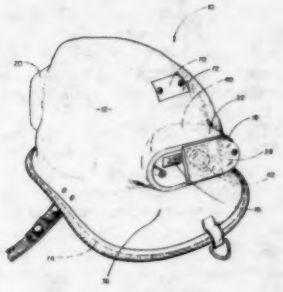
such liquid being transparent, and non-reactive with its environs and having a refractive index at least as great as that of water,
heat exchange means for cooling liquid existing from between said fibre ends and said envelope,
means for returning liquid flow causing means.

4,945,458

FIREMAN'S HELMET WITH INTEGRAL FRONT AND REAR LIGHTS

Felix M. Batts, 804 Ward Blvd., Wilson Woods, Apt. 1, and Joseph W. Walker, 504 Briggs St., both of Wilson, N.C. 27893

Continuation-in-part of Ser. No. 156,410, Feb. 16, 1988, abandoned. This application Feb. 23, 1989, Ser. No. 314,163
Int. Cl.[5] F21L *15/14*
U.S. Cl. 362—106 **18 Claims**



1. A helmet including an integral light assembly comprising:
a helmet including a surrounding wall structure having an opening formed therein and defining a head receiving area within the helmet; an opening formed wining the surrounding wall structure of the helmet; a light assembly integrally mounted within the opening formed within the side wall structure; said light assembly including an outer lense disposed within a plane that lies closely adjacent the outer surface of the surrounding wall structure, a light bulb, and a light bulb holding frame extending inwardly from the opening within the side wall structure such that it projects into the space of the head receiving area; a battery pack disposed within the head receiving area of the helmet; switch means mounted to said helmet

and operatively interconnected between the light bulb assembly and the battery pack for actuating the same; and including a clock integrally formed within the structure of the fireman's helmet whereby by actuating the clock at a selected time enables one to determine an elapsed time from the time of actuation thereby enabling one to determine how long a fireman has been exposed to a dangerous situation.

4,945,459

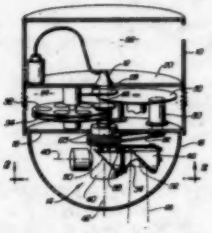
TWO-AXIS BEAM STEERING SYSTEM FOR USE IN AUTOMATED LIGHT FIXTURES

Bran Ferren, 615 Fireplace Rd., East Hampton, N.Y. 11937; Charles F. Harrison, 2620 Cool Spring Rd., Adelphi, Md. 20783; Clinton B. Hope, 75 Raynor Dr., Southampton, N.Y. 11968, and Robert J. Kohut, P.O. Box 2090 Noyac Path, Sag Harbor, N.Y. 11963

Continuation of Ser. No. 201,486, Jun. 1, 1988, Pat. No. 4,827,387. This application May 1, 1989, Ser. No. 345,496

Int. Cl.[5] F21V *7/05*

U.S. Cl. 362—284 **5 Claims**



1. A two-axis light beam steering assembly, for panning a light beam about a pan axis and tilting the light beam about a tilt axis, which is substantially perpendicular to the pan axis, the assembly comprising:

(a) an assembly housing;

(b) a light source producing a controllable light beam in a direction generally along a pan axis;

(c) a first body mounted for rotation about the pan axis and having a mirror mounted within it in the path of the light beam to reflect the beam out of said first body through an opening therein;

(d) a second body mounted in said first opening for rotation about a tilt axis that is panned upon rotation of said first body, said second body having a second mirror mounted within it in the path of the light beam reflected from said first mirror to reflect the beam out of said second body at a desired tilt angle;

(e) a first drive pulley connected to said first body;

(f) a second drive pulley connected to said second body;

(g) a pan-axis drive motor mounted on the assembly housing and having a pan-axis drive pulley;

(h) a tilt-axis drive motor mounted on said assembly housing and having a tilt-axis drive pulley;

(i) first and second interconnected drive pulleys mounted for rotation about said pan axis independently of said first body;

(j) a pan-axis drive belt coupling said pan-axis drive pulley to said first drive pulley to effect rotation of said first body about the pan axis;

(k) a first tilt-axis drive belt coupling said tilt-axis drive pulley to one of said first and second connected drive pulleys;

(l) a second tilt-axis drive belt coupling said other of said first and second connected drive pulleys to said second drive pulley.

4,945,460

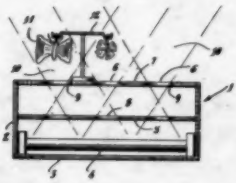
GLARE-FREE ILLUMINATING APPARATUS

Henry Von Kohorn, 945 Treasure Ln., Vero Beach, Fla. 32963

Filed Dec. 1, 1988, Ser. No. 278,442

Int. Cl.[5] F21V *7/00*

U.S. Cl. 362—290 **14 Claims**



1. In an illuminating apparatus having an electric light source housed in a container permitting light to escape upwardly in the direction of an object supported above and in close proximity to said light source, an improvement for protecting observers grouped around said apparatus from direct view of the light source and from glare produced by reflections of light from surfaces of components of said apparatus, the improvement comprising:

a first lower horizontal sheet disposed above said light source, said first sheet having an underside which is reflective and also having a plurality of apertures permitting the upward passage of light; and

a second upper light-impervious horizontal sheet, said second sheet having a plurality of apertures at least partially in vertical register with the apertures of said first sheet, wherein surfaces constituting necks of said second sheet apertures are non-reflective, said first and second sheets being vertically spaced from each other and said light source extending horizontally below substantially all of said apertures so that light escaping upwardly from said container passes through said apertures in said lower and upper sheets in a shape of a plurality of upwardly spreading light beams, the angle of divergence of the light beams being determined by size of said apertures and by distance of said lower sheet from said upper sheet and, so that observers grouped around said illuminating apparatus are completely protected from a direct view of the light source and are substantially protected from glare produced by reflections of said light from surfaces of components of said apparatus.

4,945,461

PORTABLE WORK LIGHT WITH REPLACEABLE SCUFF GUARD

James M. Crates, Charlotte, N.C., assignor to Jameson Corporation, Charlotte, N.C.

Filed May 22, 1989, Ser. No. 354,797

Int. Cl.[5] F21V *15/00*

U.S. Cl. 362—378 **14 Claims**

1. A portable work light, comprising:

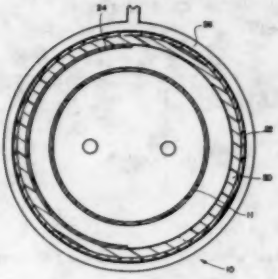
(a) an elongate bulb for emitting light when powered from an electrical current source;

(b) an elongate, transparent, relatively thick protective shield;

(c) shock absorbing means within said shield mounting said bulb within said shield in spaced-apart relation thereto against breakage of said bulb from shock or impact; and

(d) an elongate, transparent, relatively thin disposable scuff

guard positioned over said shield to protect said shield from scratching and scuffing and which can be replaced



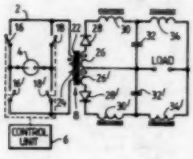
when scratched and scuffed to restore full light transmission to the work light.

4,945,462

ZERO-CURRENT SWITCHING DC TO DC FULL-WAVE MODE CONVERTER

Lev A. Lieberman, 5/12 Dror Street, Rishon LeZion, Israel 75305

Filed Jan. 18, 1989, Ser. No. 298,023
Claims priority, application Israel, Jan. 19, 1988, 85138
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—17 **8 Claims**



1. A zero-current switching DC to DC fullwave mode converter, comprising:

a controllable DC to AC converter having an input connectable to a DC source of voltage and including electronic switching means for selectively coupling said DC source of voltage across a primary winding of a power transformer circuit when the current flow through said switching means is substantially negligible;

AC to DC converter having an input connected to secondary windings of said power transformer circuit;

two charging and energy storing circuits each including a storage capacitor connected in series with one of said secondary windings; an inductor unit connected in circuit in a location between said input of said DC to AC converter and said storage capacitor and,

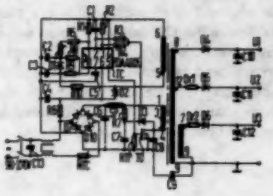
at least one discharging circuit connected across said storage capacitors and being connectable via a first and a second terminal to a load, said discharging circuit including at least one discharging inductor connected between one side of said storage capacitors and said first terminal, wherein the charging period each of said storage capacitors is smaller than the discharging period thereof.

4,945,463

SWITCHED POWER PACK WITH PROTECTIVE DEVICE FOR LIMITING OUTPUT VOLTAGE

Rainer Dangschat, Landsham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1989, Ser. No. 367,201
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 3820558
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—56 **4 Claims**



1. A switched power pack having a protective device for limiting output voltage, comprising:

a switching transistor for selectively conducting a DC voltage, the switching transistor being an avalanche-proof MOS transistor;

means for driving said switching transistor, said driving means being dimensioned so that a voltage safety margin in the range of between 5 through 20% is provided between reliable continuous operation of the switched power pack and a destruction limit of said avalanche-proof MOS transistor; and

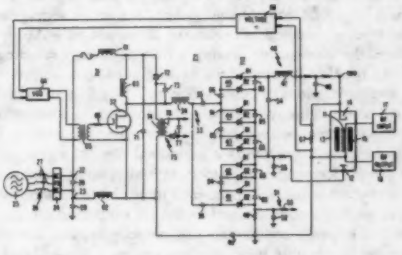
a transformer having a primary winding connected to said switching transistor to receive a selectively conducted DC voltage, said transformer having a secondary winding supplying an output voltage.

4,945,464

HIGH VOLTAGE DC POWER SUPPLY

Bradley R. Gunn, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 62,806, Jun. 15, 1987, Pat. No. 4,821,165. This application Sep. 30, 1988, Ser. No. 254,755
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] H02M *3/18*
U.S. Cl. 363—61 **22 Claims**



1. A DC power supply responsive to a relatively low voltage DC power source and a high frequency switching source comprising capacitive and diode AC to DC converter means for deriving a DC output voltage; a switch controlled by the switching source to open and closed states; a flyback choke

connected in series with the switch and the DC power source so current flows between terminals of the power source via the choke and switch while the switch is closed; resonant circuit means connected in circuit with the switch, the flyback choke and the AC to DC converter means so that each time the switch is closed (a) a half wave rectified current waveform having a duration determined by the resonant frequency of the resonant circuit means flows in the resonant circuit means and (b) a first current component having first polarity direction flows in the choke, and while the switch is open a second current component having a second polarity direction flows in the choke and the resonant circuit means, the AC to DC converter means responding to each half wave rectified current waveform to derive the DC output voltage and includes voltage multiplier means for deriving the DC output voltage as a high voltage DC and wherein the voltage multiplier means includes plural high speed signal switching diodes each having a recovery time that is a small fraction of the duration of each half wave rectified current waveform.

4,945,465

SWITCHED-MODE POWER SUPPLY CIRCUIT

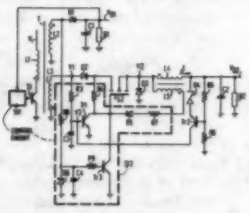
Antonius A. M. Marinus; Hubertus C. Miermans, and Guy L. P. De Bondt, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1989, Ser. No. 398,124

Claims priority, application Netherlands, Sep. 15, 1988, 8802267

Int. Cl.[5] H02M *3/335*

U.S. Cl. 363—89 **8 Claims**



1. A switched-mode power supply circuit comprising a transformer having a primary winding which is arranged in series with a first controllable switch, the series arrangement formed being coupled between the terminals of a d.c. input voltage, the transformer having a first secondary winding to which a rectifier is coupled for making a first d.c. output voltage available and a second secondary winding to which a second controllable switch is coupled for making a second d.c. output voltage available, the circuit further comprising first control means for applying a periodical control signal to the first switch for rendering said switch alternately conducting and non-conducting in dependence upon the first output voltage, as well as second control means for rendering the second switch alternately conducting and non-conducting, the rectifier being conducting when the first switch is blocked and the interval of conductance of the second switch being located in the interval of conductance of the first switch, characterized in that the second control means are implemented for a ratio between the period of conductance of the second switch and the period of the control signal of the first switch, said ratio being independent of the frequency of said signal.

4,945,466

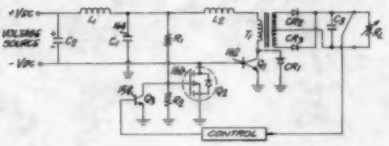
RESONANT SWITCHING CONVERTER

Walter G. Borland, 8319 Dunstaff Rd., Charlotte, N.C. 28213

Filed Feb. 22, 1989, Ser. No. 314,467

Int. Cl.[5] H02M *3/338*

U.S. Cl. 363—97 **7 Claims**



1. A resonant switching converter for providing an output voltage to a load, comprising:

(a) a first series resonant circuit including a first inductor and a first capacitor connected in series with a voltage source;

(b) a second series resonant circuit including a second inductor and said first capacitor;

(c) switch means connected in series with said second inductor and responsive to the current in said first inductor for enabling a discharge path to the load for a charge stored by said first capacitor; and

(d) a first control means responsive to the voltage on said first capacitor for operating said switch means at a controlled voltage on said first capacitor.

4,945,467

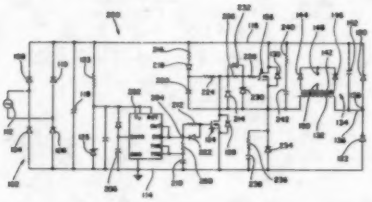
MULTIPLE-MODE VOLTAGE CONVERTER

Pradeep M. Bhagwat, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 26, 1988, Ser. No. 161,122

Int. Cl.[5] H02M *7/5387*

U.S. Cl. 363—132 **45 Claims**



1. A voltage converter, which comprises:

a load circuit;

means for coupling a power source to the voltage converter to provide a primary D.C. power source;

a secondary D.C. power source;

primary coupling means for coupling the primary D.C. power source to the load circuit to apply power of one polarity to the load circuit from the primary D.C. power source during a first portion of each cycle of operation of the voltage converter;

means for operating the primary coupling means during the first portion of each cycle;

secondary coupling means for coupling the secondary D.C. power source to the load circuit independently of the primary D.C. power source to apply power of opposite polarity to the load circuit from the secondary D.C. power source during a second portion of each cycle of operation of the voltage converter;

a tertiary D.C. power source developed through the primary coupling means during the period when the primary D.C. power source is coupled to the load circuit, and

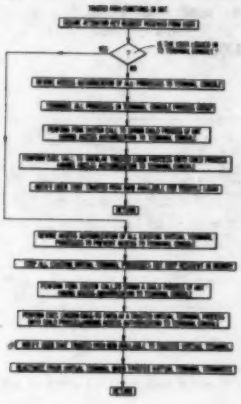
means operable independently of the means for operating the primary coupling means for coupling the tertiary D.C. power source to the secondary coupling means during the second portion of each cycle to bias the secondary coupling means and thereby facilitate the application of power of the opposite polarity to the load circuit.

4,945,468

TRUSTED PATH MECHANISM FOR VIRTUAL TERMINAL ENVIRONMENTS

Mark E. Carson, Rockville, and Abhai Johri, Gaithersburg, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1988, Ser. No. 150,965
Int. Cl.[5] H04L *9/00*; H04K *1/00*; G06F *12/14, 9/44*
U.S. Cl. 364—200 **14 Claims**



8. In a data processor, including a terminal coupled to a system memory, running an operating system which includes a virtual terminal manager means for controlling a plurality of virtual terminals in said memory, a method for establishing a protected path for a special user from said terminal to a trusted process in said memory, comprising the steps of:

receiving a secure attention request from a user;

terminating in response to said request, all existing processes associated with said terminal and revoking their access thereto when said user is not logged onto said terminal, and then establishing a trusted login process to determine whether said user is a special user; and

deactivating in response to said request, all existing virtual terminal processes associated with said terminal and revoking their access thereto when said user is logged onto said terminal as a special user, and then establishing a protected path for said user from said terminal to a trusted process in said memory.

4,945,469

HIGH SPEED STACK CIRCUIT FOR REGISTER DATA IN A MICROCOMPUTER

Kenji Yamada, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 863,886, May 16, 1986, abandoned. This application Oct. 11, 1989, Ser. No. 420,688
Claims priority, application Japan, May 17, 1985, 60-105572
Int. Cl.[5] G06F *9/46, 13/40*
U.S. Cl. 364—200 **7 Claims**

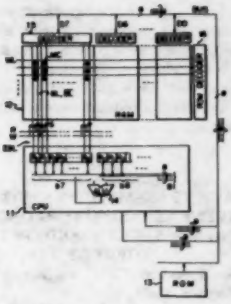
1. A microcomputer, comprising:

a central processing unit producing an address and including internal registers storing data of plural bits;

random access memory separate from said central processing unit, accessed by the address and including word lines, a fit number of bit lines and memory cells at intersections of the word and bit lines;

a data bus having a second number of data bus lines smaller than the first number, connected between said random access memory and said central processing unit, for transferring data, having a plurality of bits, between said random access memory and said central processing unit; and

a connection portion, separate from said data bus and connected between the bit lines of the random access memory and the internal registers, having the first number of conductors greater than the second number of the data bus lines, for transferring data between the internal registers and the bit lines, coupling, responsive to control by said central processing unit, the internal registers to the bit lines and transferring simultaneously, without using said data bus lines, a larger number of bits from said internal registers to said bit lines than can be transferred over said data bus.

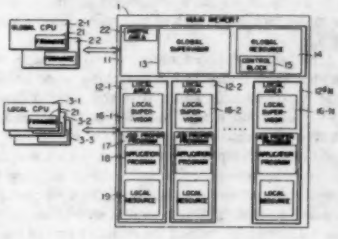


4,945,470

HIERARCHY MULTI-PROCESSOR SYSTEM AND CONTROL METHOD THEREFOR

Hideo Takahashi, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 748,870
Claims priority, application Japan, Jun. 20, 1984, 59-125120
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—200 **8 Claims**



1. A multi-processor system comprising:

a main memory having a common area occupying an address space, and a plurality of local areas each occupying respective address spaces in which there are respective application programs for jobs to be executed independently from each other;

a plurality of local supervisors each provided in the address

space of a respective one of said local areas and each being capable of executing similar operating system processes;

a global supervisor provided in the address space of said common area, said common area also containing a global resource utilized in common by said local supervisors via said global supervisor, and each local area containing a local resource utilized by the one of said local supervisors therein; and

a plurality of processors sharing said main memory for executing processing under control of said local supervisors or said global supervisor;

each of said local supervisors having means for requesting the execution of processing by said global supervisor when it requires access to a global resource in said common area in the course of processing;

said global supervisor having means for executing a processing when it receives a request from a local supervisor for such processing.

4,945,471

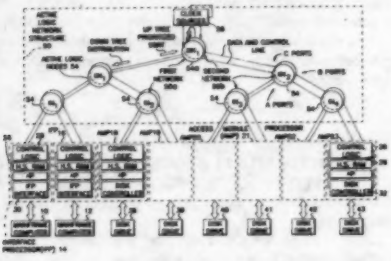
MESSAGE TRANSMISSION SYSTEM FOR SELECTIVELY TRANSMITTING ONE OF TWO COLLIDING MESSAGES BASED ON CONTENTS THEREOF

Philip M. Neches, Pasadena, Calif., assignor to Teradata Corporation, Los Angeles, Calif.

Division of Ser. No. 755,436, Jul. 16, 1985, Pat. No. 4,814,979, which is a division of Ser. No. 601,808, Apr. 19, 1984, Pat. No. 4,543,630. This application Sep. 8, 1988, Ser. No. 242,064

Int. Cl.[5] G06F *13/18, 13/40, 15/16*

U.S. Cl. 364—200 **10 Claims**



1. A message transmission network having a plurality of terminals comprising:

(a) a plurality of signal transmission means extending between the terminals, each of said transmission means comprising:

(i) a plurality of tiered bidirectional message switching nodes, each bidirectional switching node having a single upstream port and a first and second downstream port such that a first message and a second message arrive substantially simultaneously at the first and second downstream port, respectively means determining priority between the first and second colliding messages based on message data content, the upstream port connected to said first and second downstream ports and said determining means for emitting one of the first and second messages having the priority, said upstream port further transmits externally received message to the first and second downstream ports simultaneously;

(ii) a plurality of tiered transmission links, a first tier of transmission links being serially intercoupled between a terminal and a downstream port, remaining tiers of transmission links being serially interconnected between the upstream port of one bidirectional switching node and a downstream port of another bidirectional switching node occupying a successively more upstream tier; and

(b) a recirculation node, the recirculation node having a first and second input port, each said input port being intercoupled to a different one of only two remaining transmission links originating at the upstream port of only two remaining bidirectional switching nodes, the recirculating node returning a single selected message to the upstream port of each successive downstream pair of nodes, thereby returning the single selected message to all of the terminals.

4,945,472

DATA PROCESSOR WITH I/O AREA DETECTION

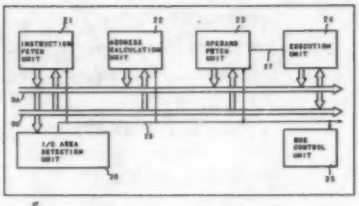
Ken Sakamura, Tokyo, and Souichi Kobayashi, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,217

Claims priority, application Japan, Sep. 30, 1987, 62-246625

Int. Cl.[5] G06F *3/00*

U.S. Cl. 364—200 **19 Claims**



1. A data processor whose I/O area is memory-mapped, comprising:

a first register which stores an address for designating said I/O area;

a second register which stores data for masking an address used for accessing;

logical AND means coupled to said second register which obtains a masked address from said data stored in said second register and an address used for accessing;

coincidence detection means coupled to said first register and said logical AND means which detects coincidence of said masked address obtained by said logical AND means and an address stored in said first register; and

means, coupled to said detection means, for outputting a coincidence signal when said coincidence detection means detects said coincidence.

4,945,473

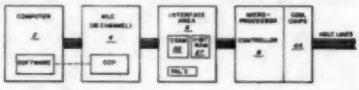
COMMUNICATIONS CONTROLLER INTERFACE

Thomas O. Holtey, Newton, Mass.; Thomas L. Murray, Jr., Hollis; Scott W. Smith, Hudson, both of N.H., and Wayne A. Perzan, Holbrook, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed May 15, 1987, Ser. No. 51,084

Int. Cl.[5] G06F *13/00, 15/16*

U.S. Cl. 364—200 **20 Claims**



1. An apparatus for transferring data between a micro-

processor control unit coupled to a plurality of communication lines and a multi-line communications unit coupled to a computer to emulate an interface for transferring data between the multi-line communications unit and multiple line adapters according to a predetermined protocol, said line adapters each including discrete registers for holding receive data, transmit data and control information, and logic circuits, said apparatus comprising:

an interface control unit coupled between said microprocessor control unit and said multi-line communications unit, said interface control unit including an interface memory and control elements, said interface memory having a plurality of addressable storage locations which are used to emulate the discrete registers and logic circuits of said line adapters;

said interface memory being mapped so as to divide said interface memory into a number of groups of locations corresponding to the number of communication lines, each group of locations including a location for receive data, a location for transmit data and a control location, said locations for receive data and said locations for transmit data emulating said discrete registers for holding receive data and transmit data, and said control locations emulating said discrete register for holding control information and said logic circuits;

said control elements generating a sequence of signals for controlling different tasks to be performed by said interface control unit; and

means for interconnecting said control elements to said interface memory so that said multi-line communications unit is able to access different ones of said control locations for updating the status of said communication lines and for enabling said interface control unit to transfer data to said receive locations for access by said multi-line communications unit and to transfer data from said transmit locations for transmission on said communication lines in a predetermined sequence consistent with said status, said control elements accessing said control locations for establishing data which is to be transferred to and from said multi-line communications unit in accordance with said predetermined protocol of said line adapter and so as to emulate the operation of said line adapter;

with said control elements monitoring accessing to said control locations concurrent with any access by said multi-line communications unit.

4,945,474

METHOD FOR RESTORING A DATABASE AFTER I/O ERROR EMPLOYING WRITE-AHEAD LOGGING PROTOCOLS

Linda C. Elliott; Gary R. Horn; Lloyd E. Jordan, II; Frank E. Levine; Cheng-Fong Shih, and William W. Myre, Jr., all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,195

Int. Cl.[5] G06F *11/00, 15/40*

U.S. Cl. 364—200 **9 Claims**

1. In a computerized database system including a storage medium for storing data files, index files, and a recovery log having a plurality of files, and a CPU for I/O to said storage medium, a method executed by said system for recovering a database after an I/O error, comprising the steps of:

(a) writing log records during normal forward processing to said recovery log on said storage medium;

(b) traversing across said recovery log on said storage medium during RESTART routine processing after said I/O error for detecting committed and uncommitted transactions, said RESTART routine including a REDO sub-routine for redoing committed transactions recorded in said recovery log;

(c) detecting said written log records in said recovery log which are incomplete or failed;

(d) executing a recovery routine;

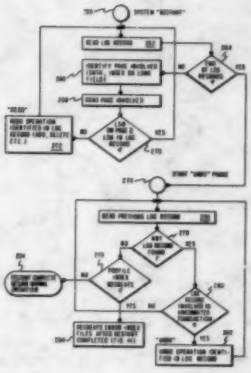
(e) executing an UNDO routine for undoing said detected uncommitted transactions;

(f) renaming said files on said storage medium having said I/O error;

(g) storing in a first file on said storage medium indicators of said renamed files that identify said renamed files as error files;

(h) accessing said first file for said indicators;

(i) preventing a subsequent RESTART routine from accessing said identified I/O error files in response to said accessing said first file;



(j) continuing said RESTART routine in response to said accessing said first file while preventing operations on said identified I/O error files during said continued RESTART routine;

(k) generating a request for access to one of said data files on said storage medium having a corresponding index file;

(l) accessing said one of said data files on said medium to determine whether said corresponding index file has been renamed thereby indicating said corresponding index file is an error index file;

(m) rebuilding said index file in response to said determination of said error index file.

4,945,475

HIERARCHICAL FILE SYSTEM TO PROVIDE CATALOGING AND RETRIEVAL OF DATA

Bill M. Bruffey, Cupertino; Gursharan S. Sidhu, Menlo Park; Patrick W. Dirks, Cupertino, and Christopher R. McFall, Palo Alto, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 924,802, Oct. 30, 1986, abandoned. This application Nov. 21, 1989, Ser. No. 442,408

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—200 **6 Claims**

1. In a computer, a hierarchial filing system to provide cataloging and retrieval of data stored on a storage device, said hierarchial filing system comprising:

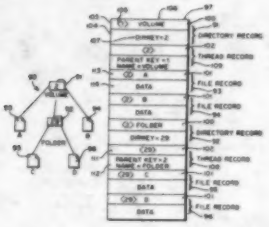
a memory for storing a program for said cataloging and retrieval;

a processor coupled to said memory and said storage device for processing an organizing means to catalog and retrieve said data; said processor comprising;

said program for organizing said data on said storage device into a hypothetical catalog which has a root directory, a plurality of branching directories arranged at various subsequent levels from said root directory, wherein some of said branching directories branch from other of said branch directories; said branching directories being interconnected such that for each of said branching directories

there is only a singular path from itself to said root directory; and wherein some of said branching directories have at least one file, each file corresponding to a representation of a predetermined portion of said stored data;

an assigning means for assigning a unique identification value to said root directory and each of said branching directories, and assigning an identification name to each of said files, root directory and branching directories, wherein each of said branching directories and files are each provided with a key comprised of its identification name and its next higher level directory identification value;



a list forming means for forming a linear list of files and directory entries such that said file and directory entries are ordered by said keys, such that said root directory being the highest level and files being the lowest level; and said interconnection of each of said singular path is provided by each file and branching directory identification name being associated with directory identification value of its next higher level;

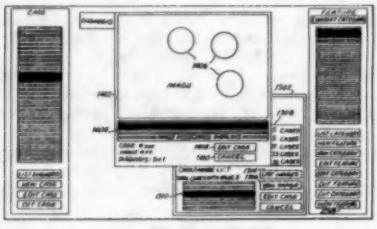
a structure forming means for forming a B-Tree indexing structure having a beginning node, a plurality of indexing nodes and a plurality of terminating nodes, and wherein said linear list is stored in said terminating nodes of said B-Tree indexing structure.

4,945,476

INTERACTIVE SYSTEM AND METHOD FOR CREATING AND EDITING A KNOWLEDGE BASE FOR USE AS A COMPUTERIZED AID TO THE COGNITIVE PROCESS OF DIAGNOSIS

Neil Bodick, Philadelphia, and Andre L. Marquis, Devon, both of Pa., assignors to Elsevier Science Publishing Company, Inc., New York, N.Y.

Filed Feb. 26, 1988, Ser. No. 161,188
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.02 **78 Claims**



76. A computerized aid to the cognitive process of diagnosis comprising:

textual knowledge base means for storing text data including: (a) case information representing multiple case records each of which includes data indicative of features that characterize the case, and (b) feature information representing multiple feature records each of which is comprised of data indicative of the components of which the features that characterize a case are formed;

image knowledge base means for storing image data representing images of features which are included in the case records stored in the textual knowledge base means;

inquiry entry means for use by an operator to enter text inquiry data designating case or feature records for selectively retrieving case information text data or feature information text data from said textual knowledge base means, and for retrieving image data from said image knowledge base means;

processor means responsive to said text inquiry data to retrieve case or feature information text data from said textual knowledge base means and to retrieve image data from said image knowledge base means in response to text inquiry data designating feature records; and

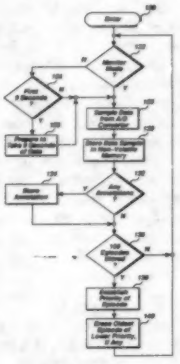
picture display means responsive to said processor means for displaying pictures corresponding to the image data retrieved from said image knowledge base means in response to said text inquiry data.

4,945,477

MEDICAL INFORMATION SYSTEM

D. Craig Edwards, Bellevue, Wash., assignor to First Medic, Bellevue, Wash.

Filed Oct. 22, 1987, Ser. No. 111,985
Int. Cl.[5] A61N *1/36*
U.S. Cl. 364—413.06 **16 Claims**



1. A medical information recording system for use with a patient having a medical state, said system receiving and storing data relating to the medical state of said patient, comprising:

monitor means for producing a monitoring ECG signal indicative of the patient's medical state;

analysis means for analyzing said ECG signal to determine if a defibrillation shock is indicated; defribrillator means for applying a defibrillator shock to said patient;

sampling means for obtaining samples of said monitoring signal, said samples having respective characteristics;

memory means for storing said samples, said memory means having a capacity limited to storing a predetermined number of said samples; and

processing means connected to said sampling means and said memory means for storing said samples in said memory means, said processing means further including prioritizing means operative whenever the number of samples obtained by said sampling means exceeds the storage capacity of said memory means, said prioritizing means overwriting previously obtained samples stored in said memory means with subsequently obtained samples, de-

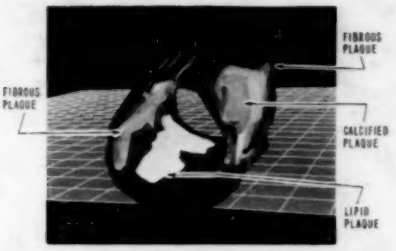
pending upon the characteristics of said previously and subsequently obtained samples.

4,945,478

NONINVASIVE MEDICAL IMAGING SYSTEM AND METHOD FOR THE IDENTIFICATION AND 3-D DISPLAY OF ATHEROSCLEROSIS AND THE LIKE

Michael B. Merickel; Charles S. Carman; James R. Brookeman; John P. Mugler, III, and Carlos R. Ayers, all of Charlottesville, Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Nov. 6, 1987, Ser. No. 117,508
Int. Cl.[5] G06F *15/70*
U.S. Cl. 364—413.22 **64 Claims**



1. A noninvasive imaging system for the display of a mammalian soft tissue live body part such as blood vessels or similar soft tissue for evaluation of soft tissue, using information obtained from multiple sequenced image slices produced by a body scan such as MRI and PET comprising:

an electronic digital storage means for storing said information;

a computer processing means for processing said information from said storage means;

a graphics display station means for displaying an image resulting from said processed information;

said computer processing means including:

means for determining the boundary of said soft tissue body part from said image slices;

means for extracting said soft tissue body part;

means for clustering and determining the different soft tissue types of interest in said body part; and

means for creating a data base for said extracted soft tissue body part including the different soft tissue types with their location and volume for displaying in contrasting delineation on said graphics display station whereby said display shows an extracted view of said body part with said different soft tissues shown delineated in their volumetric quantities and shape at the correct location in said body part.

4,945,479

TIGHTLY COUPLED SCIENTIFIC PROCESSING SYSTEM

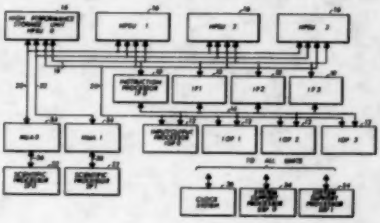
John T. Rusterholz, Roseville; Charles J. Homan, St. Paul; Lowell E. Brown, Anoka; Donald B. Bennett, Burnsville; Robert J. Malnati, St. Paul, and James R. Hamstra, Plymouth, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

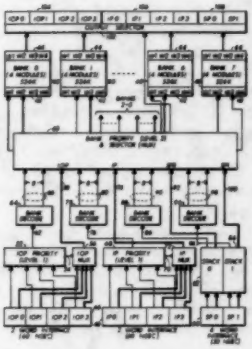
Filed Jul. 31, 1985, Ser. No. 761,139
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—200 **29 Claims**

1. A tightly coupled data processing system for executing both scientific instructions and general purpose data processing instructions comprising:

high performance storage unit means for providing addressable storage of first data words and first instruction words for use in general purpose operations and second data words and second instruction words for use in scientific operations, said high performance storage unit means including a plurality of addressable storage locations, reading and writing means, general purpose port means addressably coupled to said plurality of addressable storage locations, scientific port means addressably coupled to said plurality of addressable storage locations, and request/acknowledge means for controlling access to each referenced one of said plurality of addressable storage locations for activating said reading and writing means such that conflicts in any such references are arbitrated and only one such reference at a time is permitted;

general purpose host processor means for performing general purpose tasks and for selecting and controlling scientific tasks to be performed outside said general purpose host processor means, said general purpose host processor means including first port means directly coupled to said general purpose port means of said high performance storage unit means for reading and writing said first data





words and said first instruction words required to perform said general purpose tasks and for selecting and controlling said scientific tasks;

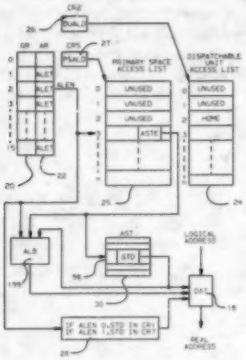
scientific processor means having second port means directly coupled to said scientific port means of said high performance storage unit means for reading and writing second data words and said second instruction words for use in scientific operations, thereby having common access to said addressable storage locations available to said general purpose host processor means, whereby a tightly coupled data processing system wherein one or more ones of said scientific processor means share said plurality of storage locations of said high performance storage unit means with said general purpose host processor means to enable rapid task activity transfer and sharing between said general purpose host processor means and said scientific processor means.

4,945,480

DATA DOMAIN SWITCHING ON PROGRAM ADDRESS SPACE SWITCHING AND RETURN

Carl E. Clark, Poughkeepsie; Alan G. Ganek, Chappaqua; Michael G. Mall, Lagrangeville, all of N.Y., and David R. Page, Romsey Hants, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1988, Ser. No. 154,685
Int. Cl.[5] G06F *12/08, 9/36*
U.S. Cl. 364—200 20 Claims



1. A computer system method for controlling the ability of an executing program to obtain access to data in a data domain, comprising:

recording program-address-space entries in a memory of the computer system in one or more system tables containing descriptors (STDs) for program address spaces,

recording a plurality of addresses in relation to the STDs for locating associated access lists (PSALs) representing data domains having data required for the execution of program instruction in an associated one of the program address spaces,

providing tokens for enabling an executing program to access data in an address space selected in a data domain defined by a PSAL of a current program address space having the executing program, each token having an AL-type indication field set to indicate which of plural types of access lists is to be accessed,

calling a program for execution including loading an address into a program control register for defining a next program address space having a next program to execute, and

concurrently loading a data domain control register with an address to a PSAL data domain associated with the next program address space,

executing the next program in which a currently-executing instruction has an operand that selects one of a plurality of general purpose registers (GPRs) as a base GPR by using a base address component of a virtual address represented in the instruction operand,

selecting an access register (AR) associated with the base GPR as a base AR containing one of the tokens previously loaded into the AR,

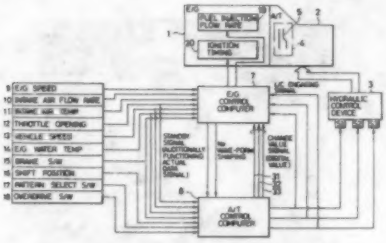
selecting a control register associated with the token in the base AR, the selected control register containing an address defining a required data domain, the token locating a selected AL entry (ALE) in an access list addressed from the selected control register to obtain access to an address space having data required by the operand.

4,945,481

SYSTEM FOR INTEGRALLY CONTROLLING AUTOMATIC TRANSMISSION AND ENGINE

Kunihiro Iwatsuki; Yoshio Shindo, both of Toyota; Kazuhiko Hayashi, Nagoya; Hiroshi Sasaoka, Okazaki; Yukio Hamano, Kobe; Keita Sakurai, Toyota; Fumiaki Izumi, Toyota, and Yuji Kashihara, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 30, 1987, Ser. No. 44,307
Claims priority, application Japan, May 8, 1986, 61-105543; Jul. 7, 1986, 61-159402
Int. Cl.[5] G05D *17/02;* G06F *15/50*
U.S. Cl. 364—424.1 9 Claims



1. A system for integrally controlling an automatic transmission and an engine, comprising:

means for controlling said engine;

means formed separately from said engine control means for controlling said automatic transmission;

means formed integrally with said automatic transmission control means for determining data for torque change control of said engine, said engine torque change control data including a value for a change in engine torque and a duration for the change in engine torque;

means for associating values of parameters for changing engine torque, by which the engine torque change value is divided into equal parts with a plurality of digital values; and

means for transmitting said digital values from said automatic transmission control means to said engine control means so as to perform the engine torque change.

4,945,482

TRANSMISSION CONTROL SYSTEM

Seiichi Nishikawa, Toyokawa; Yoshiharu Harada; Kagenori Fukumura, both of Toyota; Yoichi Hayakawa, Toyoake, and Masao Kawai, Chiryu, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 819,730, Jan. 17, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 257,149
Claims priority, application Japan, Jan. 19, 1985, 60-7771
Int. Cl.[5] G05D *17/02;* B60K *41/08, 23/08*
U.S. Cl. 364—424.1 3 Claims

1. A transmission control system for controlling a transmission, comprising

a main transmission having a speed changing mechanism and an output shaft,

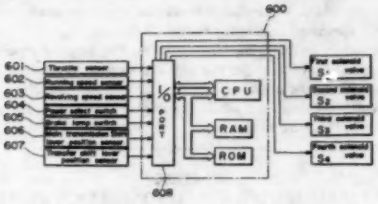
a subtransmission connected to the output shaft of the main transmission,

a control system for receiving outputs from a plurality of sensor means for sensing running state of a vehicle, said control system having first and second outputs,

first hydraulic control means for controlling the speed changing mechanism of the main transmission and controlled by the first output from the control system,

second hydraulic control means for controlling the speed

changing mechanism of the subtransmission and controlled by the second output from the control system, and a hydraulic pressure source for supplying a working fluid to the first and second hydraulic control means,



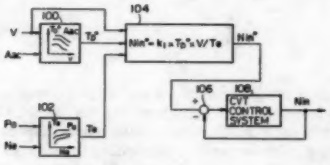
wherein said control system determines whether the main and the subtransmissions are in a transient period of the speed changing operation and said control system inhibits, as long as at least one of the main and subtransmission is in the transient period, the speed changing operation of the other transmission.

4,945,483

DRIVE CONTROL DEVICE FOR VEHICLE

Setsuo Tokoro, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 29, 1988, Ser. No. 174,900
Claims priority, application Japan, Mar. 31, 1987, 62-78938
Int. Cl.[5] B60K *41/12, 41/18;* F16H *11/06*
U.S. Cl. 364—424.1 **17 Claims**



1. A drive control device for a vehicle having a continuously variable transmission designed to continuously control a speed ratio between an input shaft and an output shaft; said drive control device comprising:

means for detecting engine load of an engine to be used in combination with said continuously variable transmission;

means for detecting a vehicle speed of said vehicle;

means for determining an engine torque of said engine;

means for detecting an actual value related to an operation of said continuously variable transmission;

means for determining a target vehicle driving torque according to at least said engine load;

means for determining a target value related to an operation of said continuously variable transmission according to at least said target vehicle driving torque, said vehicle speed and said engine torque; and

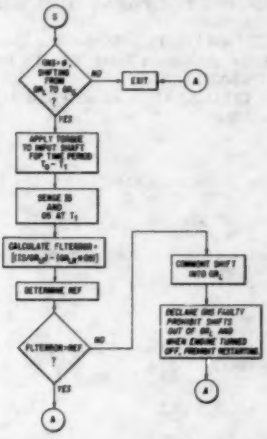
means for feedback controlling said actual value of said continuously variable transmission so that said actual value becomes said target value.

4,945,484

METHOD AND CONTROL SYSTEM FOR CONTROLLING AMT SYSTEM INCLUDING DETECTION OF ERRONEOUS GEAR NEUTRAL INDICATION

William F. Cote, Farmington Hills, and William J. Mack, Clarkston, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 13, 1988, Ser. No. 256,960
Int. Cl.[5] B60K *41/04*
U.S. Cl. 364—424.1 **14 Claims**



1. A method for controlling an at least partially automated mechanical transmission system (10) for devices having a throttle-controlled engine (14), a transmission having a plurality of gear ratio combinations selectively engageable between a transmission input shaft (114) and a transmission output shaft (20) said transmission input shaft being operatively connected to said engine by means of a selectably engageable and disengageable coupling (16) providing driving connection between said engine and said input shaft, said automatic mechanical transmission system comprising an information processing unit (42) having means for receiving a plurality of input signals including (1) a signal (GR_L) indicative of at least last engaged gear ratio of the transmission; (2) an input signal (IS) indicative of the rotational speed of the transmission input shaft; (3) an input signal (OS) indicative of the rotational speed of the transmission output shaft; and (4) an input signal (GNS) indicative of the gear neutral condition of said transmission, said gear neutral trial condition input signal having a first value (GNS=0) indicating the presence of a gear neutral condition and a second value (GNS=1) indicating the presence of a not gear neutral condition, said processing unit including means for processing said input signals in accordance with predetermined logic rules and for generating output signals whereby said transmission system is operated in accordance with said program, and means (34) associated with said transmission system effective to actuate said transmission system to effect engagement of said gear ratio combinations in response to said output signals from said processing unit, the method comprising the steps of:

during a commanded shift from a last engaged gear ratio (GR_L) to a selected gear ratio (GR_S), upon receiving an input signal (GNS=0) indicative of a gear neutral condition, sensing the presence and absence of faulty input signals indicative of the presence of a transmission gear neutral condition;

if said input signal indicative of transmission gear neutral condition is determined to be faulty, commanding an immediate shift directly into the last engaged ratio and prohibiting shifting from said last engaged gear ratio; and

upon sensing a faulty signal indicative of a transmission gear neutral condition, prohibiting said coupling from engaging after shut down of said engine.

4,945,485

METHOD FOR CONTROLLING THE OPERATION OF AN ENGINE FOR A VEHICLE

Takanori Fujimoto, and Toshiro Hara, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

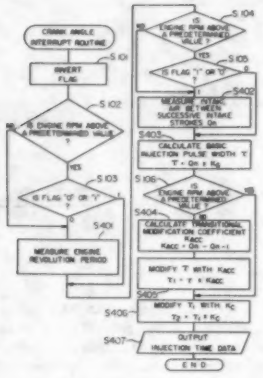
PCT No. PCT/JP88/00144, § 371 Date Sep. 28, 1988, § 102(e) Date Sep. 28, 1988, PCT Pub. No. WO88/06236, PCT Pub. Date Aug. 25, 1988

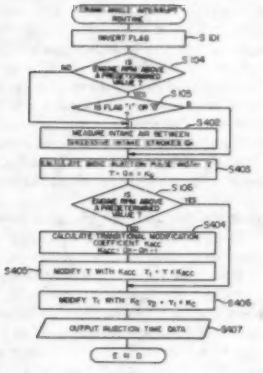
PCT Filed Feb. 13, 1988, Ser. No. 254,657

Claims priority, application Japan, Feb. 13, 1987, 62-32016; Feb. 13, 1987, 62-32017

Int. Cl.[5] **F02D** *41/26, 41/40;* **F02M** *51/00*

U.S. Cl. 364—431.05 **16 Claims**





1. An engine control method for a vehicle comprising:

sensing operating conditions of an engine through the use of various sensors,

establishing from the sensed operating conditions whether the engine is operating within a specified operating range in which variations in the sensed operating conditions of the engine are limited,

calculating a fuel injection pulse width based on the sensed engine operating conditions in a plurality of steps including a step of measuring engine revolution period and a step of measuring interstroke intake air through the use of a microcomputer,

optimizing operation of the engine by use of the fuel injection pulse width thus calculated,

calculating the steps of measuring engine revolution period and interstroke intake air every time the fuel injection pulse width is calculated while the engine operates outside the specified operating range, and

alternately calculating and omitting the step of measuring engine revolution period and the step of measuring interstroke intake air every other time the fuel injection pulse width is calculated while the engine operates in the specified operating range.

4,945,486

MULTI-COMPUTER SYNCHRONIZATION SYSTEM AND METHOD

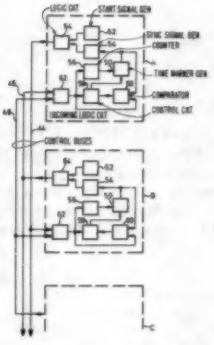
Werner Nitschke, Ditzingen; Hugo Weller, Oberriexingen, and Wolfgang Drobny, Besigheim, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 107,382, Oct. 9, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 402,979

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638947

Int. Cl.[5] **G06F** *15/50;* **H04B** *1/20*

U.S. Cl. 364—431.11 **14 Claims**



1. Method of synchronizing a plurality of computer apparatus units interconnected by at least one bus (**44, 46, 48; 70, 72**), particularly for a multi-unit computer system supervising and controlling safety apparatus, comprising the steps of:

generating a starting signal (**10, 12, 14; 16, 18, 20**) at predetermined stages in a program in each apparatus unit;

transmitting said starting signal from each apparatus unit (**A, B, C**) to each other apparatus unit;

comparing, in each apparatus unit, a time of reception of said starting signals and determining an arrival instant of a last-to-arrive starting signal (**14, 18**);

generating, in each apparatus unit (**A, B, C**), a respective time marker signal (**32, 34**);

transmitting said respective time marker signal from each apparatus unit to each other apparatus unit;

comparing, in each apparatus unit, a time of reception of said time marker signals and determining the arrival instant thereof and generating synchronizing signals (**22, 24, 26**);

transmitting said synchronizing signals from each apparatus unit to each other apparatus unit;

comparing, in each apparatus unit, said synchronizing signals with the time marker signal of the respective apparatus unit, and

if a deviation between said synchronizing signals (**22, 24, 26**) and said time marker signal (**32, 34**) is detected in the respective apparatus unit, adjusting the time of generation

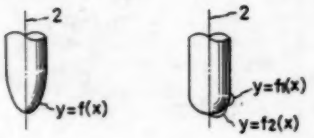
of the time marker signal in said respective apparatus unit until the time marker signal and synchronizing signal coincide.

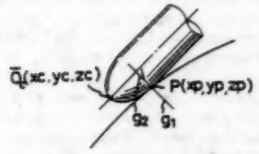
4,945,487

DATA PROCESSING DEVICE FOR THREE DIMENSIONAL SURFACE MACHINING

Rokuro Kimura, Nagoya; Kizo Hayakawa, Tokai; Kazutaka Ogo, Nagoya; Kazunari Teramoto, Toyota; Isao Ito, Nagoya; Akihiro Goto, and Yoshimasa Kuwano, both of Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jul. 29, 1988, Ser. No. 225,815
Claims priority, application Japan, Jul. 31, 1987, 62-192031
Int. Cl.[5] B23Q *33/00*
U.S. Cl. 364—474.02 **12 Claims**





1. A data processing device for machining a three dimensional surface by using a tool having a plurality of various curvature machining portions, one of which is selected in response to variations of the curvature on the three dimensional surface comprising:

(a) means for calculating information for expressing the three dimensional surface based on factors of the three dimensional surface;

(b) means for generating tool locus data

(i) by providing tool shape and dimension indicative information and machining route information,

(ii) by calculating at least one information selected from a curvature, a normal line and a tangential line of the three dimensional surface to be machined, based on said calculated information for expressing the three dimensional surface at each machining point, said tool shape and dimension indicative information and said machining route information,

said three dimensional surface being machined by the tool having various machining portions, where a graphical projection of an outermost locus of motion of the tool, located on a plane parallel to the longitudinal axis of the tool, has a shape comprising at least one curve whose curvature is changed, and

(iii) by calculating a shape condition and/or a controlling condition of the tool based on said at least one information;

(c) means for checking the tool locus data based on a predetermined pattern; and

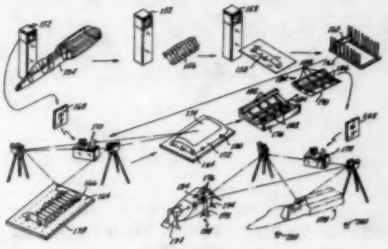
(d) means for converting the tool locus data into data to be inputted into a machine which conducts three dimensional surface machining.

4,945,488

INTEGRATED AIRCRAFT MANUFACTURING SYSTEM

Larry L. Carver, Manhattan Beach; Charles E. Zamzow, Rancho Palos Verdes; Donald D. Mladenoff, Alta Loma, and Glenn A. Lovries, Bellflower, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Continuation-in-part of Ser. No. 50,794, Apr. 14, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,599
Claims priority, application European Pat. Off., Apr. 14, 1988, 88105995.0; Japan, Apr. 14, 1988, 63-92623
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—474.24 **15 Claims**



1. A method of manufacturing tooling for aircraft construction which comprises:

constructing a definition of said aircraft in a computer memory;

defining in said computer memory a first tool means for forming a component part of said aircraft;

defining in said computer memory a second tool means for assembling a component part of said aircraft wherein said component part of said aircraft is formed with said first tool means;

downloading said definitions of said first tool means and said second tool means to means for forming tools; and

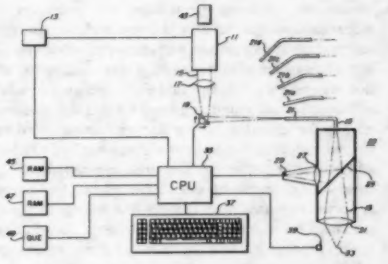
operating said means for forming tools to form said first tool means and said second tool means essentially independent from one another.

4,945,489

LASER TIME-SHARING SYSTEM

Christian Vahab, Fountain Valley, Calif., assignor to Robolase Systems, Inc., Costa Mesa, Calif.

Filed May 25, 1988, Ser. No. 198,337
Int. Cl.[5] B23K *26/00*; G06F *15/20*
U.S. Cl. 364—505 **19 Claims**



1. A laser multiplexer for time-sharing a high-power laser among a plurality of work stations, comprising:

a single laser light source capable of producing a high powered laser beam;

a plurality of optic fibers, one optic fiber for each one of said plurality of work stations, for conducting the laser beam through an interior of the optic fiber to its respective work station;

means for measuring the laser beam reaching a particular work station through the interior of the selected optic fiber; and

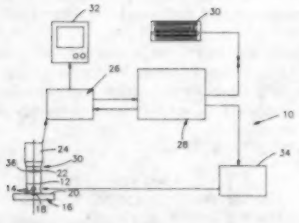
means responsive to the measurement for coupling the laser beam into an output end of the optic fiber so that the intensity of the laser beam exiting the optic fiber at the work station is at a maximum.

4,945,490

BRINELL HARDNESS INDICATOR WITH DIGITAL READOUT

Ernest L. Biddle, Jr., 1028 Great Springs Rd., Bryn Mawr, Pa. 19010; John D. Laessig, 833 Malin Rd., Newtown Square, Pa. 19073, and John B. Oehrle, 803 Newtown Rd., Villanova, Pa. 19085

Filed Apr. 11, 1988, Ser. No. 179,598
Int. Cl.[5] G06K *9/00*; G01N *3/42*
U.S. Cl. 364—506 **22 Claims**



1. An apparatus for determining Brinell hardness of a metal specimen which has been indented by a Brinell penetrator applied with a preselected force according to Brinell test criteria, comprising:

a. means for applying electromagnetic radiation to said indentation and an area of the specimen surrounding the indentation at an acute angle relative to an axis perpendicular to a surface of said specimen surrounding the indentation whereby a portion of said electromagnetic radiation is reflected by said indentation and by said surrounding area:

b. means for detecting and mapping intensities of said reflected radiation for at least a portion of said indentation and at least a portion of said area theresurrounding;

c. means for determining derivatives of mapped intensity of reflected radiation with respect to a change in position on said map for at least two points located on said map;

d. means for computing a location of a curve representing an edge of said indentation using said derivatives;

e. means for computing a diameter of said indentation using said location of the curve;

f. means for computing Brinell hardness of said specimen from said computed diameter;

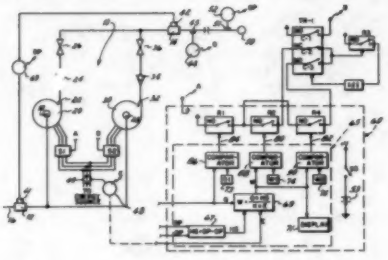
g. means for displaying said computed Brinell hardness.

4,945,491

MONITOR AND CONTROL FOR A MULTI-PUMP SYSTEM

James B. Rishel, Cincinnati, Ohio, assignor to Systecon, Inc., Cincinnati, Ohio

Continuation of Ser. No. 10,708, Feb. 4, 1987, Pat. No. 4,805,118. This application Nov. 28, 1988, Ser. No. 276,764
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[5] G01F *1/00*; G05B *11/01*
U.S. Cl. 364—510 **14 Claims**



1. Apparatus for monitoring a pumping system having a plurality of pumps coupled between an inlet header and an outer header of the system, the apparatus comprising:

(a) first transducer means for measuring fluid flow rate of the pumping system at the outlet header of the pumping system;

(b) second transducer means for measuring total dynamic head between the inlet and outlet headers of the system;

(c) third transducer means for measuring energy utilizing by the system to drive the pumps;

(d) fourth means communicating with said first, second, and third transducer means for determining wire-to-water efficiency of the system correlated to said measured fluid flow rate, total dynamic head and energy utilized; and

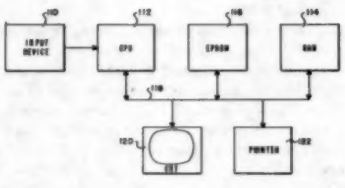
means for indicating to an operator said wire-to-water efficiency so that the operator may monitor operation of the system.

4,945,492

APPARATUS AND METHOD FOR DETERMINING NET SECTION PARAMETERS OF TRUSS CONNECTOR PLATES

Janice M. Bennett, Grand Prairie, Tex., assignor to Truswal Systems Corporation, Arlington, Tex.

Filed Dec. 30, 1988, Ser. No. 292,420
Int. Cl.[5] H04N *7/18*
U.S. Cl. 364—512 **4 Claims**



3. In a data processing system, an apparatus for determining respective lengths of overlap of a connector plate on individual wood members of a corresponding truss joint, wherein a Cartesian coordinate system having an origin corresponding to a predetermined reference point on the joint is established and

each wood member is represented by a corresponding two-dimensional polygon, each side of which is defined by a corresponding member vector, each of said member vectors having starting and ending points expressed in Cartesian coordinates relative to the reference point, said apparatus comprising:

data processing means;

input means coupled to said processing means for entering selected truss parameters into the system;

memory means coupled to said processing means for storing said selected truss parameters, said memory means having a predetermined set of program instructions stored therein;

said data processing means being responsive to said truss parameters for determining respective lengths of overlap of the plate on individual wood members of the truss joint according to said program instructions by the following steps:

representing the plate as a corresponding rectangle, each side of which is defined by a corresponding plate vector, each of said plate vectors having starting and ending points expressed in Cartesian coordinates relative to the reference point;

selecting a particular one of the wood members and determining an area of intersection of the rectangle with the polygon defined by the particular wood member, said area of intersection defining an intersection polygon;

rotating the intersection polygon and redefining the Cartesian coordinate system of the intersection polygon, so that a first axis thereof is aligned with a central major axis extending along a geometric center of a major surface of a particular wood truss member;

measuring maximum and minimum coordinates of the intersection polygon along a second axis of the redefined coordinate system, which is perpendicular to the first axis thereof, and adding the maximum and minimum coordinates to determine the length of overlap of the connector plate along an axis perpendicular to the central major axis of the particular wood member; and

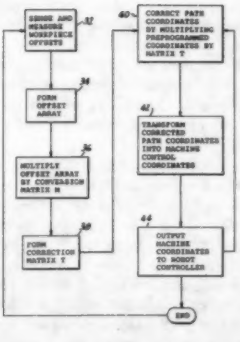
repeating the immediately preceding three steps with respect to each wood member of the joint to determine the length of overlap of the plate along an axis perpendicular to the corresponding central major axis of each wood member.

4,945,493

METHOD AND SYSTEM FOR CORRECTING A ROBOT PATH

Bernard Huang, Ann Arbor, Mich., and Veljko Milenkovic, Sturgeon Bay, Wis., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 26, 1988, Ser. No. 249,020
Int. Cl.[5] G06F 15/46
U.S. Cl. 364—513 **7 Claims**



1. A method for correcting a programmed path for a robot manipulator to compensate for variability in the location of a workpiece, comprising the steps of:

sensing and measuring offsets between the idealized location and the actual location of said workpiece at a plurality of points;

converting said measured offsets into translations and rotations of the workpiece by multiplying a matrix comprised of said offset measurements by a previously prepared conversion matrix;

correcting the coordinates of waypoints within said preprogrammed path by applying said translations and rotations to said coordinates;

transforming said corrected preprogrammed path coordinates into machine control coordinates; and

providing a controller for said robot manipulator with said machine control coordinates, wherein said conversion matrix is formed according to the steps of:

converting said machine control coordinates corresponding to a plurality of waypoints along an idealized motion path into world space coordinates and unit measurement direction vectors;

arranging a measurement matrix having rows comprised of the components of said unit measurement direction vectors and the components of the vector cross-products of said world space coordinates and said unit measurement vectors; and

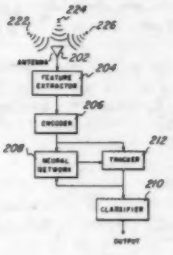
inverting said measurement matrix.

4,945,494

NEURAL NETWORK AND SYSTEM

Perry A. Penz; Michael T. Gately, both of Richardson, and Alan J. Katz, Dallas, all of Tex., assignors to Texas Instruments Incorporated

Continuation-in-part of Ser. No. 318,038, Mar. 2, 1989. This application Jun. 16, 1989, Ser. No. 367,272
Int. Cl.[5] G06F 15/18
U.S. Cl. 364—513 **8 Claims**



1. An information processor, comprising:

(a) an encoder, said encoder encoding input information at least partially into a position type code format; and

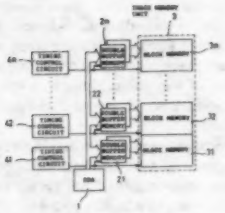
(b) a clustering neural network providing an output therefrom, said clustering network having an input receiving said output of said encoder and said output of said clustering network, said clustering neural network clustering said input thereto with thresholded analog neurons in conjunction with a learning rule and a recall rule to preserve analog aspects.

4,945,495

IMAGE MEMORY WRITE CONTROL APPARATUS AND TEXTURE MAPPING APPARATUS

Tomoaki Ueda, Kyoto, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Filed Oct. 20, 1988, Ser. No. 260,513
Claims priority, application Japan, Oct. 21, 1987, 62-266855; Oct. 28, 1987, 62-272861
Int. Cl.[5] G06F 3/00, 15/66
U.S. Cl. 364—518 20 Claims



1. An image memory write control apparatus for controlling writing of pixel data which is generated by a linear interpolation operation unit and which comprises image data and coordinate data including first coordinate data pertaining to a scanline direction of a display means and second coordinate data pertaining to a direction perpendicular to said scanline direction to an image memory unit which stores image data as output data for the display means, said apparatus comprising:

an image memory unit including a plurality of block memories;

a corresponding plurality of double buffer memories, each of said double buffer memories being selectable to receive pixel data from said linear interpolation operation unit in response to a selection control signal applied thereto, each of said double buffer memories being associated with one of said block memories and connecting its associated block memory to said linear interpolation operation unit, and each of said double buffer memories including a first buffer memory designated for receiving pixel data and a second buffer memory designated for writing image data to its associated block memory, said buffer memories being interchangeable in response to an interchange control signal whereby said first buffer memory is designated to write image data to its associated block memory and said second buffer memory is designated to receive pixel data; and

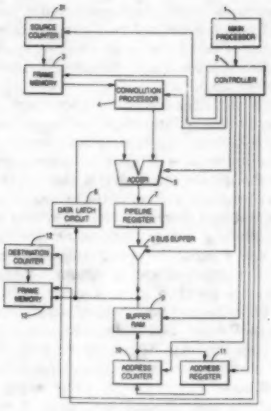
timing control means disposed to receive coordinate data from said linear interpolation operation unit, said timing control means including decoding means for decoding contents of predetermined digits of both said first and second coordinate data from said linear interpolation unit to provide decoded contents, means for generating and applying selection control signals to said double buffer memories according to the decoded contents of said predetermined digits, and means for generating and applying interchange control signals to said buffer memories of said double buffer memories according to the decoded contents of said predetermined digits.

4,945,496

APPARATUS FOR CONVOLUTION PICTURE PROCESSING USING DELAY AND INTERMEDIATE STORAGE

Mitsuo Kurakake; Shoichi Otsuka, both of Hino, and Yutaka Muraoka, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP87/00330, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/07412, PCT Pub. Date Dec. 3, 1987
PCT Filed May 23, 1987, Ser. No. 130,240
Claims priority, application Japan, May 23, 1986, 61-118686
Int. Cl.[5] G06F 15/68, 9/38
U.S. Cl. 364—518 7 Claims



1. A picture processing apparatus for performing convolution processing with respect to plural items of pixel data on a simultaneous basis with a predetermined coefficient matrix including rows and columns, said picture processing apparatus comprising:

a frame memory storing plural items of pixel data;

processing means, coupled to said frame memory, for executing convolution processing with respect to each item of said pixel data on a simultaneous basis with data from the coefficient matrix;

buffer means, coupled to said processing means, for storing intermediate processing results obtained by said processing means;

adding means, coupled to said processing means, for adding the stored intermediate processing results to intermediate processing results obtained from said processing means during a next processing cycle, and for outputting addition results;

delay means, coupled between said adding means and said buffer means, for providing a delay time and delaying the output of the addition results for the delay time and storing the addition results in said buffer means by rewriting the intermediate processing results in said buffer means; and

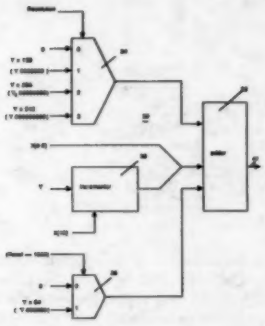
addressing means, coupled to said buffer, for designating a write address of said buffer means and for designating a read address of said buffer means upon revising the read address by an amount equivalent to a shift in the write address due to the delay time set by said delay means.

4,945,497

METHOD AND APPARATUS FOR TRANSLATING RECTILINEAR INFORMATION INTO SCAN LINE INFORMATION FOR DISPLAY BY A COMPUTER SYSTEM

Chris Malachowsky, Santa Clara, and Curtis Priem, Freemont, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 20, 1988, Ser. No. 287,493
Int. Cl.[5] G06F 3/153
U.S. Cl. 364—518 8 Claims



1. An apparatus for translating addresses corresponding to rectilinear coordinates of a plurality of scan line masks generated by a mask generator into addresses for a linear memory interface for the rapid display of an image on an output display, comprising:

an adder coupled to said linear memory interface for providing a plurality of resolutions upon which said scan line masks may be displayed on said output display;

first circuit means connected to said adder for providing a first input thereto, said first circuit means being coupled to said mask generator for receiving a Y rectilinear value therefrom, said first circuit means being further provided with an input indicative of a desired resolution for said output display;

second circuit means coupled to said adder for providing a second input thereto, said second circuit means being coupled to said mask generator for receiving a Y rectilinear value therefrom, said second circuit being further provided with an input indicative of a desired resolution for said output display; and

third circuit means coupled to said mask generator for providing a third input to said adder, said third circuit means being coupled to said mask generator for receiving a Y rectilinear value and the highest bit value of a X rectilinear value therefrom, said third input being provided with the value of the first ten bits of a X rectilinear coordinate.

4,945,498

CAD/CAM PLOTTING SYSTEM BY ONE-STROKE SKETCHING

Kazuhiro Mitamura, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

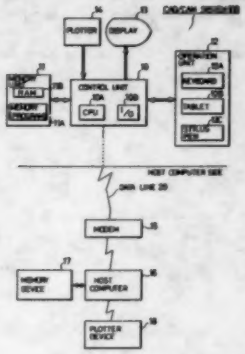
Filed Feb. 14, 1989, Ser. No. 310,132
Claims priority, application Japan, Feb. 17, 1988, 63-32812
Int. Cl.[5] G06F 3/14
U.S. Cl. 364—521 9 Claims

1. A CAD/CAM (computer-aided design/computer-aided manufacturing) plotting system wherein grapic data relating to an object to be plotted is sequentially input in accordance with instructions of a CAD/CAM program so as to plot a desired shape of said object on a display screen, comprising:

means for one-stroke-sketching a schematic outline of said object as said graphic data on the display screen;

means for pattern-recognizing said sketched schematic outline;

means for data-analyzing said pattern-recognized schematic outline;



means for determining coordinate points of said data-analyzed outline corresponding to correct dimension values of said object by inputting a predetermined number of dimension values thereof; and,

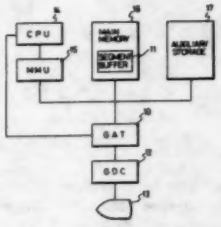
means for automatically correcting said data-analyzed schematic outline with the correct dimension values based upon said determined coordinate points.

4,945,499

GRAPHIC DISPLAY SYSTEM

Nacsuke Asari, and Nobuyuki Sakamoto, both of Tokyo, Japan, assignors to Seiko Instruments, Inc., Tokyo, Japan

Filed Jan. 12, 1989, Ser. No. 296,061
Claims priority, application Japan, Jan. 13, 1988, 63-5461
Int. Cl.[5] G06F 3/14
U.S. Cl. 364—521 22 Claims



1. A graphic display system for displaying graphic images on a monitor comprising:

first processing means for executing processes for preparing display lists from original graphic image data, said first processing means having first accessing means for providing process addresses:

memory means having memory locations associated with physical addresses for storing original graphic image data and having segment buffer capacity for storing the display lists at the physical addresses;

memory management means connected between said processing means and said memory means for mapping the process addresses to the physical addresses;

graphic display controller means for generating signals representing graphic images, said controller means having second processing means for processing the display lists and second accessing means providing graphic addresses for accessing said display lists;

graphic address transformer means connected between said graphic display controller and said memory means for mapping the graphic addresses to the physical addresses; and

monitor means connected to said graphic display controller for displaying graphic images under control of a display list.

4,945,500

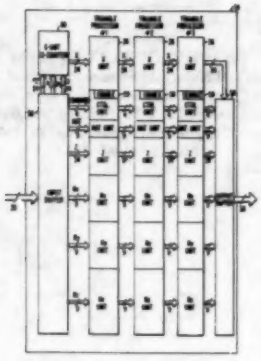
TRIANGLE PROCESSOR FOR 3-D GRAPHICS DISPLAY SYSTEM

Michael F. Deering, Mountain View, Calif., assignor to Schlumberger Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 117,110, Nov. 4, 1987, abandoned. This application Nov. 20, 1989, Ser. No. 440,459

Int. Cl.[5] **G09G** *1/06*

U.S. Cl. 364—522 **25 Claims**



1. An image processing system comprising:

a plurality of polygon processors coupled in series, each polygon process including

means for storing a representation of a single polygon, said polygon representing a portion of a three-dimensional object;

means for comparing said representation to an input representation of a pixel to determine whether said pixel is within said polygon;

means for comparing a Z position of said pixel to a Z position of said polygon; and

means for providing to an output of said polygon processor, which is coupled to an input of a next polygon processor in said series, except for a last polygon processor, a material property and Z position of said pixel in said polygon if said polygon has a Z position for said pixel in front of a received z position associated with said pixel.

4,945,501

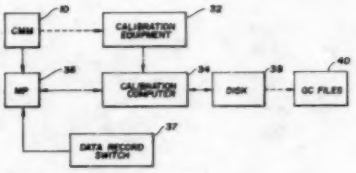
METHOD FOR DETERMINING POSITION WITHIN THE MEASURING VOLUME OF A COORDINATE MEASURING MACHINE AND THE LIKE AND SYSTEM THEREFOR

Frederick K. Bell, Centerville; Stephen N. Brown, and Michael T. Gale, both of Dayton, all of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Continuation of Ser. No. 4,435, Jan. 20, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 338,378

Int. Cl.[5] **G01C** *25/00;* **G06F** *15/46;* **G05D** *23/275*

U.S. Cl. 364—571.05 **8 Claims**



1. A method for determining the absolute position of a point in the measuring volume (**102**) of a CMM (**10**) having a probe shaft (**22**) and a probe (**14**) supported on a distal end of the probe shaft, the probe shaft having three axes of motion (X, Y, Z), the CMM including devices for providing a position signal in determining the position of the probe for each of the axes of motion in a coordinate frame of the CMM, and control means (**36**) for receiving the position signals and for providing a coordinate measurement signal which identifies the position of the probe, the method including the steps of storing (**108**) sets of axis correction data to compensate for CMM geometry errors for a range of travel in each of the axes; and determining (**112**) a subset of the axis correction data for a given position of the probe shaft relative to each of the axes of motion as a function of the position signals; wherein the improvement comprises:

the step of storing (**108**) includes storing the axis correction data in storage means of a measurement processor included in the control means;

the step of determining includes determining compensated rotation data (**48** through **64**) representing the amount of angular rotation about each of the axes for each of the axes; squareness data (**84, 94, 96**) representing the orthogonality of three different pairs of the axes; normalized straightness data (**72** through **82**) for each of said axes with respect to each of the other axes; and scale error data (**66, 68, 70**) representing error in each of the devices; and

wherein the improvement further comprises the steps of:

measuring the position of an artifact with the CMM by moving the probe of the CMM so that each of the devices provides an artifact position signal and the measurement processor provides a corresponding measurement signal as a function of the artifact position signals;

calculating probe offset data (**98**) as a function of the measured position of the artifact, the probe offset data representing the offset of the probe from the probe shaft along each of the axes;

storing the probe offset data in the storage means of the measurement processor;

retrieving the probe offset data from the storage means;

determining compensated probe offset data as a function of the probe offset data and respective compensated rotation data; and

modifying (**114**) the position signals from the devices as a function of the compensated probe offset data and the subset of axis correction data including the compensated rotation data, the squareness data, the normalized straightness data and the scale error data, the step of modifying being performed immediately after the step of determining

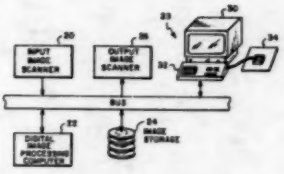
(112) the subset of axis correction data to obtain a corrected position signal in a standard coordinate frame.

4,945,502

DIGITAL IMAGE SHARPENING METHOD USING SVD BLOCK TRANSFORM

Heemin Kwon, Pittsford, and Jeanine T. Liang, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,060
Int. Cl.[5] G06F *15/332;* H04N *1/40*
U.S. Cl. 364—574 8 Claims



1. A method of processing an image in a digital computer for sharpening the image, comprising the steps of:

(a) generating a non-linear gain function based upon the measured statistics of the SVD singular values for image noise, said non-linear gain function being characterized by boosting factors applicable wherever there is a high signal-to-nose ratio;

(b) filtering the digital image to produce a detail image and a low pass filtered image;

(c) dividing the detail image into blocks;

(d) transforming the blocks employing an SVD transformation to produce singular vectors and arrays of singular values;

(e) applying the non-linear gain function to the arrays of singular values to produce arrays of modified singular values whereby to boost those singular values corresponding to a higher signal-to-noise ratio;

(f) performing an inverse SVD on the singular vectors with modified singular values to produce blocks of processed detail image values; and

(g) combining the processed image detail values with the low pass filtered image values to produce a sharpened digital image.

4,945,503

HARDWARE SIMULATOR CAPABLE OF REDUCING AN AMOUNT OF INFORMATION

Shigeru Takasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 110,982
Claims priority, application Japan, Oct. 21, 1986, 61-250557; Nov. 11, 1986, 61-266656; Mar. 20, 1987, 62-66170
Int. Cl.[5] G06F *15/20, 7/38*
U.S. Cl. 364—578 8 Claims

1. A hardware simulator for use in successively carrying out simulations of a plurality of gates included in a logic circuit, said simulator comprising:

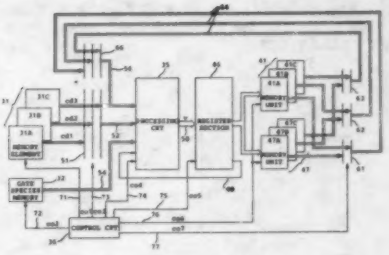
connection memory means for storing a plurality of connection data signals which specify connections of said gates and for producing a predetermined number of said connection data signals one at a time;

gate species memory means for storing a plurality of gate species data signals representative of species of said gates and for producing a predetermined number of said gate species data signals one at a time;

first memory means for storing a plurality of test data signals utilized for simulation of said gates and for successively producing each of said test data signals;

simulation execution means, coupled to said connection memory means, said gate species memory means, and said first memory means and responsive to an execution result signal, for executing said simulations of said gates in response to said predetermined number of said connection data signals, and each of said plurality of test data signals with reference to said execution result signal to successively produce a simulation result signal representative of a result of each of said simulations;

holding means for holding said simulation result signal;



supply means for supplying said simulation result signal held in said holding means to said simulation execution means as said execution result signal;

second memory means, coupled to said holding means, for successively storing said simulation result signal and for producing a stored result signal; and

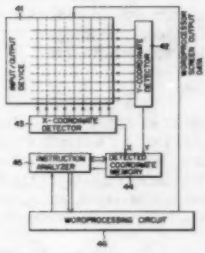
signal delivering means, coupled to said first and said second memory means and to said simulation execution means, for selectively delivering one of said each test data signal and said stored result signal to said simulation execution means.

4,945,504

INSTRUCTION INPUT SYSTEM FOR ELECTRONIC PROCESSOR

Masato Nakama, and Norihiro Hidaka, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 40,489
Claims priority, application Japan, Apr. 30, 1986, 61-97843
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—709.11 15 Claims



1. An instruction input system for an electronic processor, comprising:

touch input means having a transparent touch panel overlapped on a display means; and

instruction-analyzing means coupled to said touch input means for simultaneously determining a type of an instruction of an area of said display means in which said instruction is to be executed, both said type of instruction and

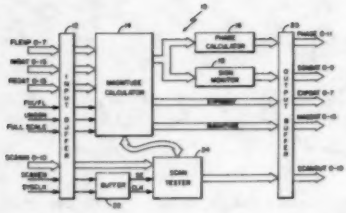
said area determined in accordance with a locus of operation positions selected by an operator on said transparent touch panel.

4,945,505

CORDIC APPARATUS AND METHOD FOR APPROXIMATING THE MAGNITUDE AND PHASE OF A COMPLEX NUMBER

Alan I. Wiener, Lexington, and Waljeet S. Hundal, Millis, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 259,018, Oct. 17, 1988, abandoned.
This application Jan. 31, 1990, Ser. No. 473,126
Int. Cl.[5] G06F *7/00*
U.S. Cl. 364—715.03 **35 Claims**



1. Apparatus for determining an approximated magnitude of a complex number or vector comprising:

means having a plurality of stages for computing a real (I) component and an imaginary (Q) component for each of a plurality of vector rotations of fixed decreasing predetermined values of angles such that the value of said Q component is reduced by approximately one-half each of said vector rotations after a first rotation, said I and Q components for each of said vector rotations being computed by one of said plurality of stages respectively, the value of said I component at the end of said rotations being said approximated magnitude; and

each of said vector rotation stages of said computing means comprising shifting means for shifting said Q component on each rotation after said first rotation into a vacated most significant bit (MSB) position of said Q component resulting from said vector rotations in order to accommodate a one bit LSB growth in the next rotation; and

said shifting means further comprises means for left justifying said I component and correspondingly shifting said Q component into said vacated MSB position of said Q component before each of said rotations after said first rotation is performed, providing the three most significant bits of said I component are zero.

4,945,506

HIGH SPEED DIGITAL SIGNAL PROCESSOR CAPABLE OF ACHIEVING REALTIME OPERATION

Toru Baji, Kodaira; Hirotsugu Kojima, Tokyo; Nario Sumi, Kokubunji; Yoshimune Hagiwara, Hachioji, and Shinya Obba, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Chiba, both of, Japan

Filed Mar. 17, 1989, Ser. No. 324,830
Claims priority, application Japan, Mar. 18, 1988, 63-63313
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—736 **4 Claims**

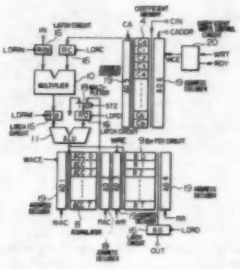
1. A digital signal processor for computing a vector product between a column vector input signal including a plurality of data items and a matrix including predetermined number of coefficient data items so as to produce a column vector output signal including a plurality of data items, said processor comprising:

(1) input means for serially receiving said plurality of data items of the column vector input signal;

(2) first store means for storing therein in a first cycle the data items received by said input means;

(3) coefficient memory means for storing therein the predetermined number of coefficient data items of the matrix;

(4) second store means for reading from said coefficient memory means data items in a direction of a row of the matrix among the predetermined number of coefficient data items in a second cycle shorter in time than the first cycle so as to store therein the data items thus read from said coefficient memory means;



(5) multiply means for multiplying the data items outputted from said first store means by data items delivered from said second store means;

(6) third store means connected to an output from said multiply means;

(7) add means having a first input connected to an output from said third store means;

(8) fourth store means having an output connected to a second input of said add means; and

(9) accumulator means having an input connected to an output from said add means and having an output connected to an input of said fourth store means.

4,945,507

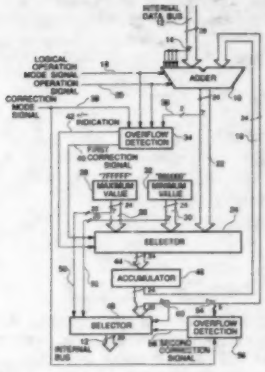
OVERFLOW CORRECTION CIRCUIT

Ryuji Ishida, and Toyoo Kiuchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 364,478
Claims priority, application Japan, Jun. 10, 1988, 63-144065
Int. Cl.[5] G06F *11/00*
U.S. Cl. 364—737 **10 Claims**

1. An overflow correction circuit coupled to receive an output of an arithmetic operation circuit, the arithmetic operation circuit having first and second data inputs, the first data input being connected to an internal data bus so as to receive data to be subjected to an arithmetic operation, the output of the arithmetic operation circuit outputting a result of arithmetic operation, the overflow correction circuit comprising a first selector having a first input connected to receive the result of arithmetic operation from the arithmetic operation circuit and a second input and an output, a corrected value generating circuit having an output connected to the second input of the first selector, a first overflow detection circuit coupled to receive a part of the output of the arithmetic operation circuit and for generating a first overflow signal indicative of whether or not there occurs an overflow in the result of the arithmetic operation, the first overflow signal being supplied to the first selector so as to control the first selector in such a manner that when the first overflow signal does not indicate occurrence of the overflow, the first selector outputs the output of the arithmetic operation circuit as its output and when the first overflow signal indicates occurrence of the overflow, the first selector outputs the output of the corrected value generating

circuit as its output, and an accumulator having an input connected to receive the output of the first selector and an output



connected to the second data input of the arithmetic operation circuit.

4,945,508

PROCESS AND DEVICE FOR SIMULATING A SYNCHRONOUS ELECTRIC MACHINE

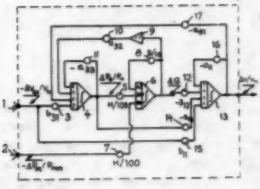
Richard Bénéjean, Montigny le Bretonneux, France, assignor to Service Electricite de France National, Paris, France

Continuation of Ser. No. 36,528, Apr. 9, 1987, abandoned. This application Nov. 9, 1989, Ser. No. 433,461

Claims priority, application France, Apr. 10, 1986, 86 05141

Int. Cl.[5] G06G 7/63

U.S. Cl. 364—802 **2 Claims**



1. An analog simulator for simulating the state of an electrical synchronous electric rotating machine whose behaviour in steady state condition may be represented by a set of steady state equations:

$$d/X(t)/\ /dt = A.X.(t) + B.U.(t)$$

$$Y(t) = C.X(t)$$

in which

X(t) is a state vector having three components constituting state parameters of an alternator, a first component $\Delta V(t)/V_n$ representing at instant t the relative variation of the voltage of the stator, a second component $\Delta\Omega(t)$ representing variations of the speed of the synchronous machine, and a third component $\Delta P_r(t)/P_n$ representing the relative variations of the electric power;

U(t) is an input vector having two components constituting input parameters of operation, consisting of a first component $\Delta V_{ex}(t)/V_{exn}$ representing the relative variations of the excitation voltage of the machine, and a second component $\Delta P_m(t)/P_{mn}$ representing the relative variation of the mechanical power applied to the machine;

Y(t) is an output vector having components constituting output parameters of operation, consisting of a first component $\Delta\delta'(t)$ representing the total internal angle variations between the voltage of the network and the e.m.f. of the machine, a second component $\Delta Q_r(t)/Q_n$ representing the relative variations of the reactive power, a third component $\Delta I(t)/I_n$ representing the relative variations of the current of the stator, and a fourth and a fifth components $\Delta\rho(t)$ and $\Delta\Psi(t)$ respectively representing the variations of the internal angle between the voltage of the stator and the e.m.f. of the machine and the variations of the transport angle between the voltage of the stator and the voltage of the network.

and A, B and C are matrices whose coefficients are selected to define the relations between the state parameters in a specific alternator, the relations between the state parameters and the input parameters in said specific alternator and the relations between the state parameters and the output parameters in said specific alternator, respectively,

comprising a cascaded arrangement of first integrator means, second integrator means and third integrator means,

said first integrator means having a plurality of inputs one of which is connected to receive an electrical signal representing said first component of the input vector and the other of which are connected to receive, through respective amplifying means, the outputs of said first integrator means, of said second integrator means and of said third integreator means and being arranged to deliver an electrical output signal representative of said third component of the state vector on an output thereof,

said second integrator means having a plurality of inputs, comprising a first input connected to receive the output of said first integrator means, a second input connected to provide a feedback signal from the output of said second integrator means and a third input connected to receive an electrical signal representative of said second component of the input vector and being constructed to deliver an electrical output signal representative of said second component of the state vector on an output thereof,

said third integrator means having a plurality of inputs respectively connected to receive the output of said second integrator means, a feedback loop from the output of said third integrator means, the output from said first integrator means and said signal representative of said first component of the input vector and being constructed to deliver an electrical output signal representative of said first component of the state vector; and

means for delivering the components of said output vector from the outputs of said first, second and third integrator means.

4,945,509

DUAL LOOK AHEAD MASK GENERATOR

Stephen B. Barrett, Williston; John Bula, Essex Junction, and Alvar A. Dean, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1988, Ser. No. 168,031

Int. Cl.[5] G06F 7/00

U.S. Cl. 364—900 **10 Claims**

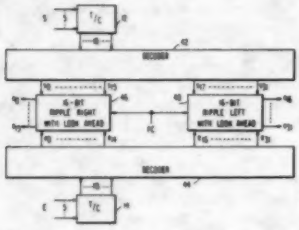
1. A mask generator responsive to a starting address and an ending address for generating a mask word having a plurality of mask bits of a first logical level and a plurality of mask bits at a second logical level, with said plurality of mask bits of said first logical level beginning and ending at start and end positions in said mask word defined by said beginning and ending addresses, respectively, said mask generator comprising:

decoder means for decoding said beginning and ending addresses and for providing a plurality of start outputs corresponding to said start address and a plurality of end outputs corresponding to said ending address;

first ripple circuit means responsive to at least portions of each of said start and end outputs for generating a first ripple portion output including a plurality of bits forming

a first portion of said mask word, said first ripple circuit, when said starting address indicates a start position within said first portion of said mask word, generating a first logical level signal propagating from said start position in said mask word towards a higher order bit position thereof; and

second ripple circuit means responsive to at least portions of



each of said start and end outputs for generating a second ripple circuit output including a plurality of bits forming a second portion of said mask word, said second ripple circuit, when said ending address indicates an end position in said second portion of said mask word, generating a first logical level signal propagating from said end position in said mask word towards a lower order bit position thereof.

4,945,510

REGISTER DEVICE

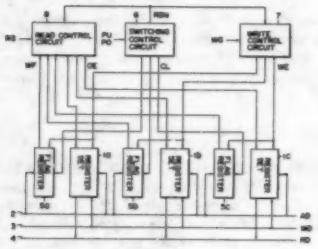
Ken-ichi Maeda, Kamakura; Mitsuo Saito, Yokosuka; Takeshi Aikawa, Tokyo; Tsukasa Matoba, Kawasaki, and Mitsuyoshi Okamura, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1987, Ser. No. 133,737

Claims priority, application Japan, Dec. 19, 1986, 61-303443

Int. Cl.[5] G06F *12/00*

U.S. Cl. 364—900 **9 Claims**



1. A register device comprising:

a register set group consisting of a plurality of prioritized register sets each constituted by a plurality of registers, said register sets having an equal number of said registers;

switching control means for receiving a saving/ recovery instruction and selecting a current register set to be used from said register set group to store data from a write signal line, in accordance with said saving/recovery instruction, a register set of lower priority than said current register set being no longer accessed, thereby saving data that is stored in said lower priority register set;

write control means for writing, in response to a write instruction, data into a register of said current register set selected by said switching control means;

write flag memory means for holding a write flag representing whether data is written in each of said registers; and

read control means for determining, in response to a read instruction, a register in which data is written most recently, from among said plurality of registers with reference to said write flags, and for reading out data from said register.

4,945,511

IMPROVED PIPELINED PROCESSOR WITH TWO STAGE DECODER FOR EXCHANGING REGISTER VALUES FOR SIMILAR OPERAND INSTRUCTIONS

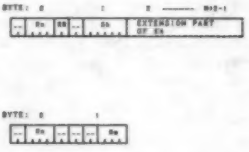
Fujio Itomitsu, and Toyohiko Yoshida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,961

Claims priority, application Japan, Jul. 4, 1988, 63-166307

Int. Cl.[5] G06F *9/00*

U.S. Cl. 364—900 **1 Claim**



1. A data processor which has a pipeline processing mechanism comprising an instruction fetch means for fetching instructions including a first data transfer instruction having a format describing a destination operand designating field and a source operand designating field disposed in a first ordered sequence and also including an addressing mode designating field and a second data transfer instruction having a format describing the source operand designating field and the destination operand designating field disposed in a second ordered sequence opposite said first ordered sequence and also including an addressing mode designating field, an instruction decoding means for decoding the instruction fetched by said fetch means, and an instruction execution means for executing the instruction according to the decoding result of said instruction decoding means, wherein said instruction decoding means comprises:

a first instruction decoding part which decodes the instruction fetched by said instruction fetch means and produces an intermediate code including said source and destination operand designating fields in said first or second sequence if the fetched instruction is said first or second data transfer instruction respectively and including a parameter having a first value when the instruction fetched is said first data transfer instruction and a second value when the instruction fetched is said second data transfer instruction; and

means, coupled to receive said intermediate code and controlled by said first parameter, for exchanging said source operand and destination operand designating fields included in said intermediate code when said parameter has

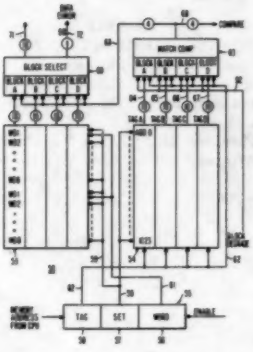
said first value so that said first and second data transfer instructions are processed identically in the instruction execution means when the addressing mode designating field designates register direct addressing.

4,945,512

HIGH-SPEED PARTITIONED SET ASSOCIATIVE CACHE MEMORY

Clarence W. DeKarske, St. Paul Park, and Aaron C. Peterson, Columbia Heights, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 7, 1988, Ser. No. 241,436
Int. Cl.[5] G11C *7/00, 29/00*; G06F *11/00*
U.S. Cl. 365—49 **17 Claims**



1. A high-speed partitioned set associative cache memory, comprising:

high-speed cache memory data array means associated with a CPU,

said cache memory data array means having a plurality of individual partial data array boards which together comprise said memory data array,

a full tag array mounted on each of the individual data array boards and coupled to an individual partial data array,

a plurality of memory address registers, at least one mounted on each partial data array board and associated with each individual partial data array and each individual tag array on each of the data array boards,

said memory address registers being adapted to receive an address from said CPU and for simultaneously accessing said partial data arrays and said tag arrays on all of said data array boards,

logic circuit and control means mounted on a separate board from said plurality of individual partial data array boards for monitoring output error signals from said data arrays and from said tag arrays resulting from accessing memory addresses, and

means for subsequently identifying the exact data or tag array where an error has occurred.

4,945,513

GATE ARRAY DEVICE

Masahiro Ueda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

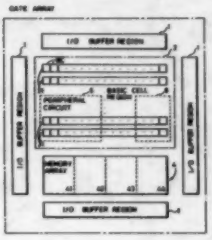
Filed Oct. 17, 1988, Ser. No. 258,592
Claims priority, application Japan, Oct. 19, 1987, 62-264577
Int. Cl.[5] G11C *5/10*
U.S. Cl. 365—51 **6 Claims**

1. A gate array device comprising:

a memory array region comprising a plurality of memory cells for storing data signals;

an input-output buffer means region for transferring to and from said memory cells said data signals and address signals for designating said memory cells;

a basic cell region including a plurality of basic cells each comprising a first field effect device of one conductive type and a second field effect device of the opposite conductive type;



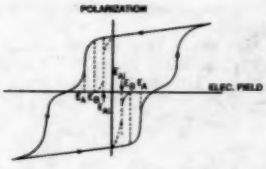
access means comprising and plurality of basic cells in said basic cell region for accessing said memory cells in response to said address signals, said access means being connected between said input-output buffer means and said memory cells.

4,945,514

METHOD OF BISTABLE OPTICAL INFORMATION STORAGE USING ANTIFERROELECTRIC PHASE PLZT CERAMICS

Cecil E. Land, 2118 Gretta NE., Albuquerque, N. Mex. 87112

Filed May 31, 1988, Ser. No. 200,104
Int. Cl.[5] G11C *11/22*
U.S. Cl. 365—117 **11 Claims**



1. A method of bistable storage of optical information comprising:

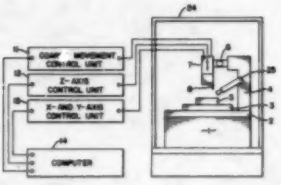
applying a switching electric field across a portion of a surface of a material capable of shifting between a stable antiferroelectric (AFE) and a ferroelectric (FE) phase, the switching field causing the portion of the material to shift from the AFE phase to the FE phase; and

subsequently illuminating parts of the portion to cause the illumination parts to shift back to the AFE phase, whereby the difference in phase between the illuminated parts and the remainder of the portion of the surface represents spatially modulated information.

4,945,515
MEMORY WRITING APPARATUS

Manabu Ooumi; Toshihiko Sakuhara, and Tatsuaki Ataka, all of Tokyo, Japan, assignors to Seiko Instruments, Inc., Chiba, Japan

Filed Sep. 12, 1988, Ser. No. 243,512
Claims priority, application Japan, Sep. 10, 1987, 62-227366; Sep. 29, 1987, 62-245334; Sep. 29, 1987, 62-245335; Oct. 7, 1987, 62-253157
Int. Cl.[5] G11C 7/00; G11B 9/00
U.S. Cl. 365—174 **11 Claims**

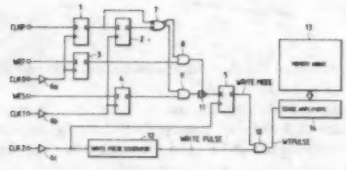


1. Data writing and storage apparatus comprising:
a memory having a surface and composed of a material which is located at the surface and which is constituted by individual segments each having an atomic or molecular scale and each capable of individually undergoing a change in physical state in response to an electrical signal;
an input section for placing each segment into a physical state corresponding to the value of a respective data bit, said input section comprising at least one needle having a fine tip portion dimensioned to apply an electrical signal to an individual memory segment in order to control the physical state of one segment at a time; and
control means for controlling the input section, said control means comprising means for positioning the tip portion of the needle close to the surface of the memory, means for scanning the tip portion of the needle over the surface of the memory and means for controlling a distance between the tip portion of the needle and each individual segment on the surface of the memory while the tip portion of the needle scans thereover to effect change of the physical state of the individual segments to thereby write a data bit into each segment.

4,945,516
WRITE CONTROL CIRCUIT FOR A HIGH-SPEED MEMORY DEVICE

Masamori Kashiyama, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,225
Claims priority, application Japan, Oct. 9, 1987, 62-253769
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—189.05 **7 Claims**

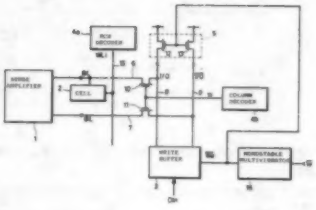


1. A write control circuit of a memory device comprising:
a first receiving circuit for receiving a first write enable signal with a pulse duration equal to two write cycles;
a second receiving circuit for receiving a second write enable signal with a pulse duration equal to two write cycles and having a phase difference equal to at least one write cycle relative to said first write enable signal;
a converting circuit connected to said first and second receiving circuits for converting said first write enable signal into a first write signal with a pulse duration equal to one write cycle and said second write enable signal into a second write signal with a pulse duration equal to one write cycle and having a phase difference relative to said first write signal equal to the phase difference between said first and second write enable signals; and
a generating circuit connected to said converting circuit and responsive to each of said first and second write signals for generating in each signal period of said first and second write signals a write execute signal for controlling execution of a write operation.

4,945,517
DYNAMIC RANDOM ACCESS MEMORY

Hideshi Miyatake; Masaki Kumanoya; Hideto Hidaka; Hiroyuki Yamasaki; Konishi Yasuhiro, and Yuto Ikeda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,256
Claims priority, application Japan, May 13, 1987, 62-117405
Int. Cl.[5] G11C 7/00, 8/00
U.S. Cl. 365—189.01 **1 Claim**



1. In a dynamic RAM device including:
a plurality of word lines (15);
a plurality of bit lines (6, 7) intersecting with said word lines;
a plurality of memory cells (2) provided in intersections of said word lines and said bit lines;
addressing means (4a, 4b) for selecting a word line and a bit line intersecting a selected memory cell;
I/O means (8, 9) connected with said bit lines for reading and writing data from and into said memory cells;
I/O load means (5) connected between said I/O means and a voltage source;
write means (3) for providing said I/O means with write voltage for writing data into said memory cells; and
means for rendering said I/O load means active during a write operation of a fast page mode of operation after a time period shorter than a pulse in a read/write indicating signal (W) pulse in a W operation, thereby to permit a change of column address immediately after an end of a writing cycle, comprising:
charge restart means for restarting charge of said I/O means before the end of the writing cycle,
said charge restart means including
monostable multivibrator means (16) responsive to the leading edge of said pulse of said read/write indicating signal (W), for providing an effective read/write signal pulse (We) having a shorter duration than that of the read/write indicating signal pulse (W);
said write means operable in response to termination of said shorter duration We pulse to begin application of a write voltage to said I/O means,
thereby providing to said I/O means a high voltage by the time a write operation is completed to permit a column address to change immediately upon attainment of a high

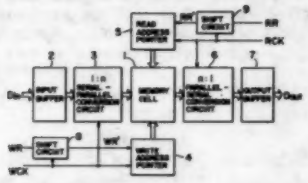
level by a column address signal at the end of a write cycle.

4,945,518

LINE MEMORY FOR SPEED CONVERSION

Kunio Muramatsu, Fujisawa, and Seigo Suzuki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 8, 1989, Ser. No. 363,276
Claims priority, application Japan, Jun. 9, 1988, 63-141979
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—233 **6 Claims**



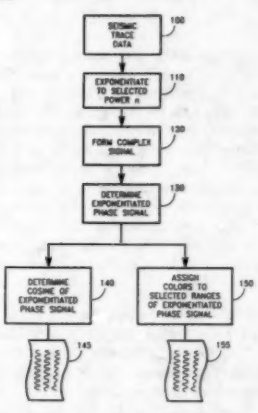
1. A line memory for speed conversion comprising; a memory cell having a plurality of memory regions having addresses, write means for writing input data into said regions of said memory cell in order of said address at a first rate and resetting a write address of said region in a predetermined period, read means for reading said data out of said regions of said memory cell in order of said address at a second rate different from said first rate and resetting a read address of said region in said predetermined period, first shift means for shifting reset timing of said write address, and second shift means for shifting reset timing of said read address, both of said first and second shift means being able to set shift quantities of said reset timing of said write and read addresses to the same value.

4,945,519

METHOD OF GEOPHYSICAL EXPLORATION

Timothy D. Stanley, Broken Arrow, Okla., and John H. Bodine, Houston, Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 28, 1989, Ser. No. 317,301
Int. Cl.[5] G01V *1/34*; G06F *15/36*
U.S. Cl. 367—48 **14 Claims**



1. A method of geophysical exploration, comprising the steps of:

(a) obtaining a set of seismic trace data;

(b) exponentiating each seismic trace to a selected power n where n is greater than 1

(c) determining the Hilbert transform of the exponentiated seismic trace and determining a ratio of the Hilbert transformed exponentiated seismic trace data to the exponentiated seismic trace data;

(d) obtaining a measure of an exponentiated phase angle from the arctangent of such ratio; and

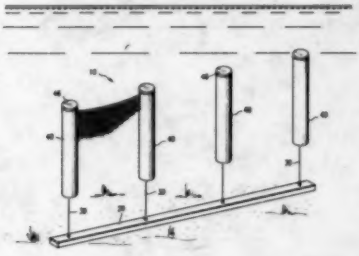
(e) interpreting the geological character of the set of seismic trace data with the exponentiated phase angle.

4,945,520

HYDRO-ACOUSTIC DEVICE FOR WARNING SEA MAMMALS

Thomas J. Ford, 209 Harvard St., #206, Brookline, Mass. 02146

Filed Sep. 27, 1989, Ser. No. 413,067
Int. Cl.[5] H04B *11/00*
U.S. Cl. 367—191 **2 Claims**



1. A passive hydro-acoustic device for warning sea mammals away from shallow areas comprising:

a. anchor means linearly arranged in front of a shallow area;

b. a plurality of cable means attached to said anchor means at predefined intervals and extending substantially perpendicular therefrom;

c. a hollow annular member attached at a first end of said cable means and containing a gas therein;

d. cap means affixed to a second end of said hollow annular member sealing said hollow annular member.

4,945,521

WATCH

Kurt Klaus, Schaffhausen, Switzerland, assignor to IWC International Watch Co. AG, Schaffhausen, Switzerland

Filed Jul. 21, 1989, Ser. No. 383,877
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1988, 3832514
Int. Cl.[5] G04B *19/22, 17/12*
U.S. Cl. 368—21 **33 Claims**

1. A watch comprising

a drive, a spring loaded detent connection, and a setting element;

an hour wheel rotatable about an axis of rotation by the drive;

a rotatable universal-time hour wheel arranged coaxially to the hour wheel, each of the hour wheels being connected by the spring-loaded detent connection, the universal-time hour wheel being rotatably reset by the setting element stepwise relative to the hour wheel by overcoming a spring force of the detent connection;

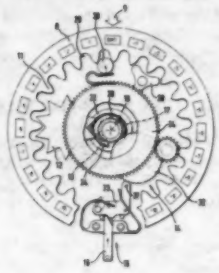
a coupling means for coupling the setting element to the universal-time hour wheel in order to reset the latter and for decoupling the resetting element from the universal-time hour wheel after a setting of the universal-time hour wheel;

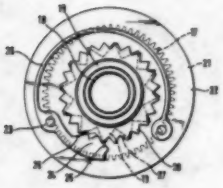
an hour hand connected to the hour wheel;

a universal-time hour hand connected to the universal-time hour wheel, the hands providing that the times of two different time zones can be indicated on a fixed dial face;

a transmission element for setting the universal-time hour wheel; and wherein

the setting element is a time-zone ring which is arranged





concentric to the axis of rotation and which can be rotatably reset stepwise from detent position to detent position; and the transmission element for setting the universal-time hour wheel can be driven by the time-zone ring.

4,945,522

TIME INDICATOR FOR A CLOCK OR WATCH

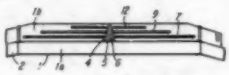
Winfried Radel, Strippchens Hof 7, 4330 Mulheim/Ruhr, Fed. Rep. of Germany

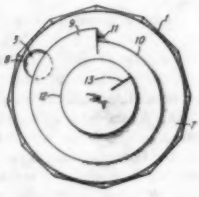
Filed Jun. 6, 1988, Ser. No. 203,474

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 8708097[U]

Int. Cl.[5] G04B *19/20, 19/06*

U.S. Cl. 368—77 **7 Claims**





1. In a time indicator for a watch that has a watch plate and at least two time-indicating elements that are at least partially superimposed over one another, that are driven by centrally and coaxially disposed drive elements, that provide advantages of an analog reading and that also essentially realize advantages of a digital watch so that a precise time reading is offered without further additional visual marks, the improvement therewith which comprises:

said time-indicating elements being formed by dials that are disposed in different planes and rotate about centrally disposed shaft means as said drive elements; to indicate time, at least one dial being provided with means that cover or optically suppress all other information that at any given time is not necessary for reading off that time;

said dials being different sizes;

the sizes of said dials progressively decrease in dial surfacing from the bottom toward the top in a mounted arrangement thereof on said centrally disposed shaft means; and

a first dial, which is provided with said means, to indicate the time, in the form of opening means, and also a second dial, which is provided with an outer rim that follows a spiral path, and is also provided with an essentially radially extending rim portion that connects an outwardly disposed end of said spiral path with an inwardly disposed end of said spiral path.

4,945,523

TIMEPIECE GLASS ASSEMBLY AND A TIMEPIECE

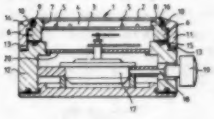
Philip Y. Lam, Room 1107, Hang Shing Building, 363-373 Nathan Road, P.O. Box 96259, T.S.T., Kowloon, Hong Kong

Filed Dec. 5, 1989, Ser. No. 446,980

Claims priority, application United Kingdom, Dec. 6, 1988, 8828406

Int. Cl.[5] G04B *37/00*

U.S. Cl. 368—285 **9 Claims**



1. A timepiece glass assembly having a pair of superimposed, spaced apart, transparent glasses, means for holding said glasses around their peripheries in said spaced apart disposition to define between and with said glasses an internal chamber for containing a fluid, at least one passage through said holding means providing communication between said chamber and the exterior of the holding means for said fluid and semi-sealing means co-operating with said holding means at least partially to seal said at least one passage on the holding means exterior in a manner such as to allow fluid from said chamber to pass along said at least one passage and escape therefrom via the semi-sealing means in a controlled manner.

4,945,524

COMPACT OPTICAL PICKUP APPARATUS FOR OPTICAL DISK PLAYER

Toyonori Igata, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 181,951

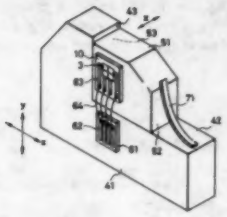
Claims priority, application Japan, Apr. 15, 1987, 62-57288[U]; Apr. 15, 1987, 62-57290[U]; Apr. 15, 1987, 62-57291[U]

Int. Cl.[5] G11B *7/00;* **H01J** *5/02;* **H01S** *3/19*

U.S. Cl. 369—44.11 **2 Claims**

1. An optical pickup apparatus comprising: an optical detec-

tor formed on a substrate for detecting light reflected by a recording medium; a pattern formed on said substrate; a first block on which said substrate is fixed; first reference surface means formed on said first block substantially in parallel with an optical axis of said light to be detected; a second block



arranged to be movable so as to be adjusted in a plane perpendicular to said optical axis and to support said first block; second reference surface means formed on said second block so as to correspondingly contact with said first reference surface means; and a relay substrate fixed on said second block and electrically connected to said pattern.

4,945,525

OPTICAL INFORMATION PROCESSING APPARATUS

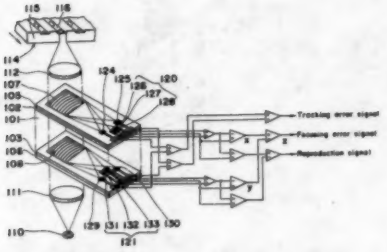
Osamu Yamamoto, Nara; Toshihiko Yoshida, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1988, Ser. No. 239,753

Claims priority, application Japan, Sep. 4, 1987, 62-222457; Sep. 4, 1987, 62-222458

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.12 **4 Claims**



1. An optical information processing apparatus comprising:

a substrate;

means for projecting a plurality of laser light sports onto a recording medium;

optical waveguide means formed on said substrate for receiving and for dividing laser light spots reflected from said recording medium into two sets of reflected light;

photo-detector means for producing a tracking error signal from a comparison of the light intensity of each of said sets of reflected light.

4,945,526

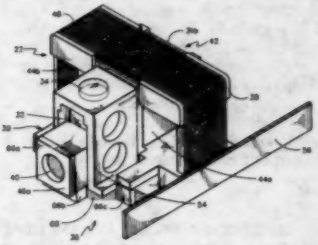
ACTUATOR ASSEMBLY FOR OPTICAL DISK SYSTEMS

Gerardus L. M. Jansen, Cascade; Leonardus J. Grassens, Colorado Springs, and Zdenek T. Hollen, N. Colorado Springs, all of Colo., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Oct. 18, 1988, Ser. No. 259,129

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.11 **23 Claims**



1. An actuator assembly for use in an optical disk information processing system comprising:

(a) an actuator body, said body defining a first channel and having a center of mass;

(b) a slide rail, said rail passing through said first channel;

(c) means for focusing an incoming optical beam onto said optical disk, said focusing means including a lens, said lens being displaced from said center of mass in a first direction; and

(d) means for applying a motive force to said body along a first line approximately parallel to said first channel, said line being substantially coincident with or displaced from said center of mass in said first direction.

4,945,527

OPTICAL PICKUP APPARATUS FOR DETECTION OF FOCUSING ERROR, TRACKING ERROR, AND INFORMATION

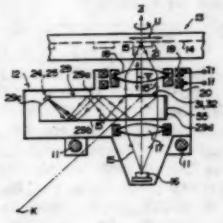
Hiroshi Sunagawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1988, Ser. No. 251,479

Claims priority, application Japan, Sep. 30, 1987, 62-247319; Sep. 30, 1987, 62-247320; Sep. 30, 1987, 62-247321

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.11 **22 Claims**



1. An optical pickup apparatus comprising:

(i) a light source for irradiating a light beam onto a surface of an optical recording medium,

(ii) an objective lens for converging said light beam onto the reflection surface of said optical recording medium,

(iii) a light guide disposed in such a direction that one surface

thereof receives the light beam reflected by said optical recording medium,

(iv) a focusing grating provided at an incidence position of said reflected light beam on one surface of said light guide for making said reflected light beam enter said light guide in such a direction that said reflected light beam advances toward an edge face of said light guide by repetition of total reflection between said one surface of said light guide and the other surface of said light guide facing said one surface, and converging the light beam thus guided and advancing inside of said light guide,

(v) a photodetector secured to the surface or the edge face of said light guide for detecting said guided light beam converged by said focusing grating,

(vi) an error detection circuit for carrying out detection of tracking error and detection of focusing error on the basis of an output of said photodetector, and

(vii) a signal detection circuit for detecting signals recorded on said optical recording medium on the basis of the output of said photodetector.

4,945,528

METHOD OF RECORDING BINARY INFORMATION IN A MAGNETO-OPTICAL STORAGE LAYER, AND ARRANGEMENT FOR CARRYING OUT THE METHOD

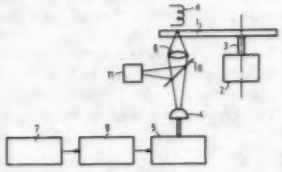
Jan H. Crasemann, Hamberg, German Democratic Rep., assignor to U.S. Philips Corp., New York, N.Y.

Filed Aug. 22, 1988, Ser. No. 235,254

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728237

Int. Cl.[5] H04N *5/76*

U.S. Cl. 369—59 **4 Claims**



1. A method of recording binary information in a magneto optical storage layer comprising the steps of:

heating a selected area of the storage layer to approximately the Curie temperature by means of a laser beam of limited duration for one bit; and

dividing each laser beam of limited duration into a plurality of short pulses separated by pulse spacings, said pulses being essentially incident on the same selected area of the storage layer and each having an energy adequate to heat the exposed area of the storage area to approximately the Curie temperature.

4,945,529

OPTICAL HEAD COMPRISING A DIFFRACTION GRATING FOR DIRECTING TWO OR MORE DIFFRACTED BEAMS TO OPTICAL DETECTORS

Yuzo Ono; Yutaka Yamanaka, and Yasuo Kimura, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

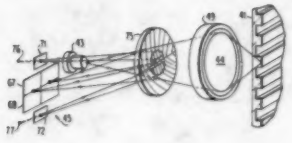
Filed Dec. 10, 1986, Ser. No. 940,007

Claims priority, application Japan, Dec. 10, 1985, 60-278365; Dec. 12, 1985, 60-280603; Jan. 24, 1986, 61-14144; Mar. 18, 1986, 61-60305; Mar. 18, 1986, 61-60306; May 26, 1986, 61-121575; May 26, 1986, 61-121577; Jun. 10, 1986, 61-132723; Jun. 10, 1986, 61-132724; Jul. 2, 1986, 61-156406; Aug. 27, 1986, 61-202245

Int. Cl.[5] G01J *1/20*; **G11B** *21/10, 7/13*

U.S. Cl. 369—109 **25 Claims**

1. An optical head device for use in combination with an optical source for generating a coherent beam along a main optical axis and an optical recording medium, said optical head device including a focussing lens for focussing an input beam on said optical recording medium along a lens axis of said focussing lens and responsive to an optical beam reflected from said optical recording medium for producing an output beam along said lens axis, wherein the improvement comprises a diffraction grating having a plurality of grating regions responsive to said coherent beam for producing a zeroth-order diffracted beam as said input beam and responsive to said output



beam for directing a plurality of sidewards diffracted beams to an optical detector assembly along a plurality of side optical axes, said diffraction grating having substantially no dependency on p-polarized and s-polarized beams and substantially no focal power, each of said grating regions having a grating pattern of slits along interference fringes between spherical wave fronts of two coherent beams having beam axes coincident with said main optical axis and a selected one of said side optical axes.

4,945,530

CARTRIDGE FOR OPTICAL DATA DISCS

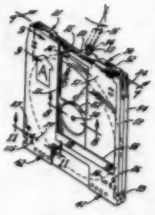
Patrick B. Sandell, Bartlett, and Albert Ditzig, Hoffman Estates, both of Ill., assignors to Opticord, Inc., Chicago, Ill.

Division of Ser. No. 120,614, Nov. 13, 1987, Pat. No. 4,908,817, which is a continuation-in-part of Ser. No. 930,874, Nov. 14, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,075

The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.

Int. Cl.[5] G11B *25/04, 7/00*

U.S. Cl. 369—291 **14 Claims**



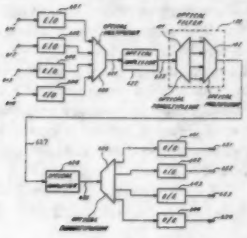
1. A protective cartridge for a data information disc comprising a pair of interlocking shells enclosing said disc, a sliding door movable from a closed position for covering said disc to an open position for exposing said disc during a read operation, said door including a pair of shutters each having a flat planar portion overlapping a respective one of the shells, a slide separate from said shutters upon which said shutters are mounted, and said slide having an outer periphery and said shells having a portion internally within said cartridge which together define a cooperating guide track and groove for supporting said slide and the shutters mounted thereon and for guiding their movement relative to said shells.

4,945,531

OPTICAL WAVELENGTH-DIVISION MULTIPLEX TRANSMISSION SYSTEM WITH AN OPTICAL FILTER FOR SPONTANEOUS EMISSION NOISE

Syuji Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 39,193, Apr. 16, 1987, abandoned. This application Jul. 21, 1989, Ser. No. 383,256
Claims priority, application Japan, Apr. 17, 1986, 61-89148
Int. Cl.[5] H04J *14/02*
U.S. Cl. 370—3 15 Claims



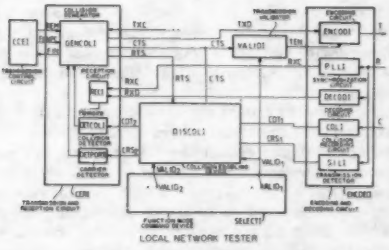
1. An optical wavelength-division multiplex transmission system comprising optical multiplexer means (620) for multiplexing a plurality of optical signals having different wavelengths into a wavelength-division multiplexed optical signal, optical amplifier means (622) optically coupled to said optical multiplexer means for directly amplifying said wavelength-division multiplexed optical signal without resort to opto-electric and electro-optic conversions to produce an amplified wavelength-division multiplexed optical signal, optical filter means (100) optically coupled to said optical amplifier means for suppressing undesired spectra of the amplified wavelength-division multiplexed optical signal to produce a filtered wavelength-division multiplexed optical signal, and optical demultiplexer means (626) optically coupled to said optical filter means for demultiplexing said filtered wavelength-division multiplexed optical signal into a plurality of optical signals each having a different frequency component.

4,945,532

LOCAL NETWORK TESTING USING CARRIER SENSE MULTIPLE ACCESS AND COLLISION DETECTION (CSMA/CD)

André Hald, Villiers-Saint-Frederick, France, assignor to Bull, S.A., Paris, France

Filed Mar. 15, 1989, Ser. No. 323,888
Claims priority, application France, Mar. 18, 1988, 88 03576
Int. Cl.[5] H04J *1/16, 3/14*
U.S. Cl. 370—13 22 Claims



1. A tester for local networks having at least one elementary segment with a number of stations on the segment, each of said stations having a transmission and a reception circuit and an encoding/decoding circuit, the tester comprising:

a transmission and reception circuit;

an encoding/decoding circuit;

means for detecting the presence of a transmission from a station;

said transmission and reception circuit including a collision generating means responsive to the detection of a transmission presence;

means for applying said frame of data through said encoding/decoding circuit to an elementary segment;

means for detecting collisions; and

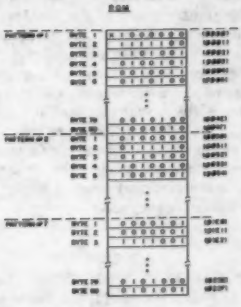
means for verifying that said means for detecting collisions correctly detects collisions.

4,945,533

METHOD AND APPARATUS FOR TRANSMITTING DATA

George L. Schroeder, Sherwood; Francis O. Couch, Portland, and Chamna Saengsaiporn, Aloha, all of Oreg., assignors to Kentrox Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 210,728, Jun. 23, 1988, Pat. No. 4,881,221. This application Jun. 7, 1989, Ser. No. 363,953
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] H04B *3/20*
U.S. Cl. 370—32.1 17 Claims



7. A method of controlling a tone responsive device on a bit-synchronous digital data circuit, comprising the steps:

providing a serial data stream corresponding to a digitally encoded control tone; and

sequentially transmitting N different versions of said data stream, where N is the number of data bits in a byte, with each of said versions being bit shifted relative to the other versions;

wherein one of said versions will be effective to control the tone responsive device.

4,945,534

PROGRAMMABLE CONFERENCING MODULE FOR RING ARRAYS AND SWITCHABLE RING ARRAY NETWORKS

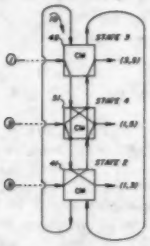
John L. Driscoll, Jeannette; Edward K. H. Law, Monroeville, both of Pa.; Gerald M. Masson, Baltimore, Md.; Giorgio L. Coraluppi, Pittsburgh, and Michael A. Kancel, Bridgeville, both of Pa., assignors to Compunetics, Inc., Monroeville, Pa.

Continuation of Ser. No. 94,984, Sep. 10, 1987, abandoned. This application Jul. 19, 1989, Ser. No. 383,230
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—62 26 Claims

1. A conferencing network for establishing conference comprising:

a first, second and third station, each station having a transmit port and a receive port;

a first, second and third conferencing module capable of being in predetermined states, each conferencing module having an A input port and an A output port, said second and third modules having a B input port and a C output port, said first and second modules having a B output port and a C input port, said B output port and C input port of the first conferencing module linked to the B input port and C output port, respectively, of the second conferencing module, said B output port and C input port of the second conference module linked to the B input port and



C output port, respectively, of the third conferencing module, the transmit port of the first, second and third stations linked to the A input port of the first, second and third conferencing modules, respectively, the receive port of the first, second and third stations linked to the A output port of the first, second and third conferencing modules, respectively such that said first, second and third conferencing modules form an open ring array;

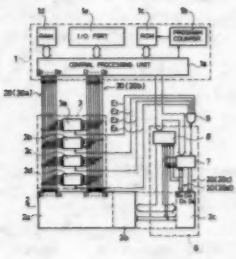
and control means for placing the conferencing modules in the proper states to establish the desired conferences between the stations, said control means in connection with each conferencing module.

4,945,535

INFORMATION PROCESSING UNIT

Osamu Hosotani; Koichi Kawauchi, and Naoki takahashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,433
Claims priority, application Japan, Aug. 25, 1987, 62-210607
Int. Cl.[5] G06F *11/10*
U.S. Cl. 371—11.1 **3 Claims**



1. An information processing unit comprising:

a memory device which stores a data word at a standard memory address;

with each standard memory address specifying several memory areas in which to store said data word and wherein each of said several memory areas is identified by an internal address;

a central processing unit which accesses said data word stored in said memory device by sending said standard memory address to an address control device;

said address control device, coupled to said central processing unit, stores said internal address and combines said internal address with said standard address to form a compound address specifying a given one of said several memory areas in which said data word is stored;

an error detection device, coupled to said memory device and said address control device, which generates an error signal if the data word read from said memory device contains an error;

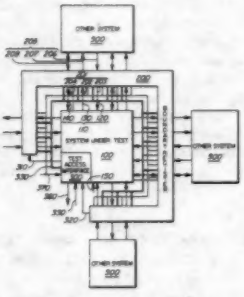
said address control device having an internal address update device which, upon receipt of said error signal, prevents the use of the given memory area used to store said error containing data word by selecting a new internal address, and wherein said address control device forms a new compound address.

4,945,536

METHOD AND APPARATUS FOR TESTING DIGITAL SYSTEMS

Marius Hancu, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 9, 1988, Ser. No. 242,244
Int. Cl.[5] G01R *31/28*
U.S. Cl. 371—22.3 **30 Claims**



1. A method for testing a digital system having a plurality of system terminals for coupling input signals into the system and output signals out of the system during normal operation of the system, the method comprising:

connecting at least some of the system terminals in parallel to boundary register means, said boundary register means being operable to pass input signals and output signals transparently through the boundary register means while accumulating together said input signals and said output signals;

initializing the state of the digital system and the state of the boundary register means to predetermined states;

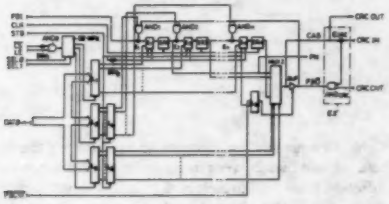
running the digital system and boundary register means through a predetermined number of clock cycles while passing known input signals through the boundary register means into the system and accumulating together within the boundary register means said known input signals and output signals provided by the digital system to generate a test result pattern; and

comparing the generated test result pattern to a predetermined test result pattern.

4,945,537
MAXIMUM LENGTH LINEARLY OCCURRING CODE SEQUENCE GENERATOR

Masaaki Harada, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,984
Claims priority, application Japan, Jun. 11, 1987, 62-146527
Int. Cl.[5] G06F 11/10
U.S. Cl. 371—37.1 9 Claims



1. An apparatus comprising a maximum length linearly occurring code sequence generator which includes:

a shift register which has a plurality of units in cascade connection, each said unit including an exclusive logical sum gate having first and second inputs and an output, a flip-flop having a data input and a data output, an AND gate having first and second inputs and having an output coupled to said first input of said exclusive logical sum gate, and a steering gate having a first input coupled to said output of said exclusive logic sum gate, having a second input, and having an output coupled to said data input of said flip-flop;

means for applying a respective control signal to said first input of said AND gate of each said unit;

means for applying a respective initial condition signal to said second input of said steering gate of each said unit;

a multiplexer having a plurality of data inputs which are each coupled to said data output of said flip-flop of a respective said unit and having a data output, said multiplexer selecting said output of one of said flip-flops present at a respective one of said data inputs of said multiplexer and supplying it to said data output of said multiplexer; and

a selectively actuable three-state buffer having a data input coupled to said data output of said multiplexer and having a data output coupled to said second input of said AND gate of each said unit of said shift register;

wherein said second input of said exclusive logical sum gate of each of said units other than a first of said units is coupled to the data output of the flip-flop of a different said unit.

4,945,538
METHOD AND APPARATUS FOR PROCESSING SAMPLE VALUES IN A CODED SIGNAL PROCESSING CHANNEL

Arvind M. Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

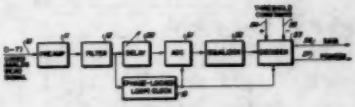
Filed Nov. 14, 1988, Ser. No. 270,895
Int. Cl.[5] G06F 11/10
U.S. Cl. 371—43 24 Claims

1. A method of processing, in a signal processing channel, digital values corresponding to a digitized incoming analog signal representative of coded binary data, comprising the steps of:

using a state-dependant sequence detection algorithm iterated by successive clock cycles, advancing from a current state to a next state,

precomputing appropriate functional expressions of digital sample values for a preselected number of sample values ahead of a then current sample value;

comparing preselected ones of said functional expressions against corresponding thresholds to provide respective binary decision outputs; and

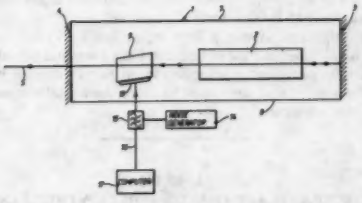


using said binary decision outputs in conjunction with state values corresponding to the current state, determining state values for the next state following said current state, which become current state values for the next iteration of the clock cycle.

4,945,539
ACOUSTO-OPTIC TUNABLE FILTER

John M. Bagshaw; Lionel W. J. Kent; Terence F. Willats, all of Chelmsford, and Steven J. Payne, Basildon, all of United Kingdom, assignors to The General Electric Company, p.l.c., London, United Kingdom

Filed Feb. 13, 1989, Ser. No. 309,522
Claims priority, application United Kingdom, Feb. 17, 1988, 8803705
Int. Cl.[5] H01S 3/117, 3/10
U.S. Cl. 372—13 13 Claims



1. An acousto-optical filter comprising

(a) an anisotropic crystal having an optic axis and a face;

(b) an acoustic transducer connected to said face;

(c) a signal generator for generating a signal having a plurality of frequencies;

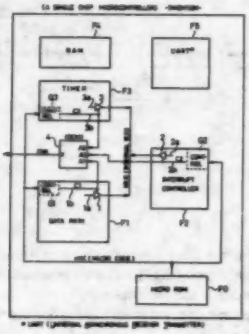
(d) means for applying said signal to said transducer, said transducer projecting an acoustic wave into said crystal in a direction normal to said face; and

(e) means for directing an optical wave onto said crystal, the angle of said face relative to the optic axis of said crystal and the value of said signal being such that said acoustic wave causes wavelength-specific diffraction of said optical wave which nearly, but not completely satisfies the parallel tangents phase matching condition, whereby a substantial angular field of view for said optical wave is obtained, the angle of the face of said crystal also being such that said diffraction is polarization-insensitive.

4,945,540
GATE CIRCUIT FOR BUS SIGNAL LINES

Kouichi Kaneko, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,784
Claims priority, application Japan, Jun. 30, 1987, 62-164303
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—57.1 5 Claims



1. In a bus gating circuit of the type for gating one of a plurality of input signals onto an internal bus line of a microcontroller, wherein the internal bus line provides for communication among a plurality of signal sources, with each input signal being connected to the internal bus line by a corresponding gate element that couples or isolates the corresponding input signal to or from the internal bus line depending on the active or inactive state of a control signal received by the gate element, a failure detection circuit for detecting an error condition in which two or more input signals are simultaneously coupled to the internal bus line, the failure detection circuit comprising:

circuit means responsive to the control signal lines for generating an error signal when more than one of the control signal lines are active, the error signal providing an indication of a control signal error, wherein the input signals are unchanged by the error signal; and

a multiplexer having a first input line carrying the error signal, a second input line carrying a normal signal from a microcontroller, a selection input line to choose between the inputs, and an output to carry the signal output of the selected input.

4,945,541
METHOD AND APPARATUS FOR CONTROLLING THE BIAS CURRENT OF A LASER DIODE

Takao Nakayama, Tokyo, Japan, assignor to Digital Equipment Corporation, Maynard, Mass.

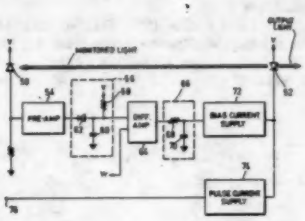
Filed Jun. 28, 1989, Ser. No. 373,158
Claims priority, application Japan, Sep. 9, 1988, 63-225045
Int. Cl.[5] H01S 3/13
U.S. Cl. 372—31 23 Claims

1. An apparatus for controlling the optical output intensity of a laser diode used in an optical communication system to periodically transmit data, wherein said laser diode receives current from a pulse current supply and a bias current supply, comprising:

first means for receiving a portion of the optical output of said laser diode and delivering a first signal having a magnitude proportional to the optical intensity of said laser diode optical output;

second means for receiving said first signal, detecting the magnitude corresponding to the minimum magnitude of said optical output, and delivering a second signal having a magnitude corresponding to said minimum magnitude of said optical output; and

third means for comparing the magnitude of said second

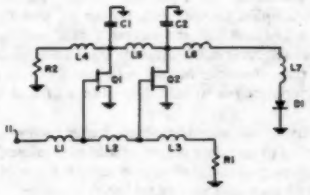


signal to a preselected magnitude and altering the magnitude of said bias current in response to said second signal differing from said preselected magnitude, independent of the presence and absence of data being transmitted.

4,945,542
LASER DIODE MODULATOR

Louis R. Brothers, Jr., Boston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 31, 1989, Ser. No. 359,492
Int. Cl.[5] H01S 3/00, 3/10
U.S. Cl. 372—38 3 Claims



1. A laser diode modulator comprising:

a series of transistors; each having an input terminal and an output terminal, the input terminals exhibiting a characteristic shunt capacitance;

an input circuit for receiving a modulating signal, said input circuit comprising a series of inductive elements, the input terminals of successive ones of said transistors being connected to said input circuit between successive ones of said inductive elements;

an output circuit comprising a series of inductive elements, the output terminals of successive ones of said transistors being connected to said output circuit between successive ones of the inductive elements; and

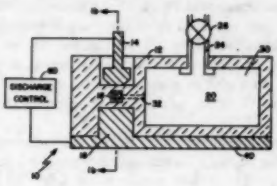
a tuning capacitor shunting each of said transistor output terminals, the values of said output circuit inductive elements forming, with said tuning capacitors, a singly terminated filter providing a graduated and decreasing characteristic impedance, the laser diode to be modulated being connected to the low impedance end of said output circuit.

4,945,543

GAIN MEDIUM FOR RADIANT ENERGY SOURCE

Richard C. Sharp, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 1, 1989, Ser. No. 401,706
Int. Cl.[5] H01S 3/22, 3/223
U.S. Cl. 372—55 9 Claims



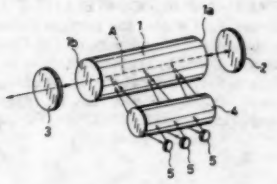
1. A gain medium for use in a radiant energy source comprising a gas mixture including carbon dioxide, carbon monoxide and deuterium.

4,945,544

DIODE LASER PUMPED SOLID-STATE LASER

Haruo Tanaka, Shiga, and Naotaroh Nakata, Kyoto, both of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Mar. 28, 1989, Ser. No. 329,570
Claims priority, application Japan, Mar. 29, 1988, 63-075655
Int. Cl.[5] H01S 3/091
U.S. Cl. 372—70 5 Claims



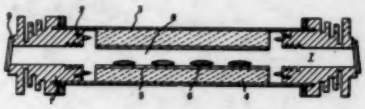
1. A solid-state laser comprising:
a laser rod having a central longitudinal axis;
a total reflection mirror arranged on the extension of said longitudinal axis in facing relation to one end face of said laser rod;
a half mirror arranged on the extension of said longitudinal axis in facing relation to the other end face of said laser rod;
a plurality of laser diodes arranged in an array which is spaced laterally from said laser rod in parallel to said longitudinal axis, said array of laser diodes emitting pumping light toward said laser rod; and
a cylindrical lens arranged in parallel to said longitudinal axis between said laser rod and said array of laser diodes, said lens serving to focus said pumping light from said array of laser diodes substantially on said longitudinal axis to generate efficiently a laser beam along said longitudinal axis within said laser rod.

4,945,545

COLD ELECTRODE METAL VAPOR LASER

James A. Piper, Sydney, Australia, assignor to Metalaser PTY, Australia

PCT No. PCT/AU87/00045, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/05159, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 18, 1987, Ser. No. 165,985
Claims priority, application Australia, Feb. 18, 1986, PH4674
Int. Cl.[5] H01S 3/097, 3/22
U.S. Cl. 372—87 4 Claims



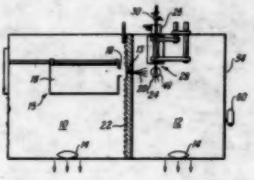
1. A pulsed metal vapor laser having an optical resonator cavity and a discharge volume for amplifying stimulated emissions, wherein said discharge volume is defined by a tubular chamber the ends of which are closed by terminating flanges characterized in that there is formed integrally with a flange only a single cold cathode structure having a plurality of means for non-thermionic electron generation to sustain a high current, pulsed discharge in the discharge volume of the laser upon application of a high voltage electrical pulse between the terminating flanges of the tube.

4,945,546

PURELY CHEMICAL PROCESS YIELDING CONTINUOUS LASER AMPLIFICATION IN THE VISIBLE AND ULTRAVIOLET SPECTRAL RANGES

James L. Gole, Atlanta, Ga.; James R. Woodward, Chagrin Falls, Ohio, and Stephen H. Cobb, Mayfield, Ky., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Jan. 4, 1989, Ser. No. 293,322
Int. Cl.[5] H01S 3/095
U.S. Cl. 372—89 41 Claims



23. A chemical laser for amplification of visible and ultraviolet light comprising means for producing metal trimers from a source of metal, means for dissociating halogen molecules to form halogen atoms, a reaction chamber, and means for delivering the metal trimer and halogen atoms into the reaction chamber to chemically react the metal trimer and halogen atoms to form electronically excited metal dimer molecules in sufficient concentration to create a population inversion and laser amplification.

4,945,547

LASER BEAM PROCESSING APPARATUS

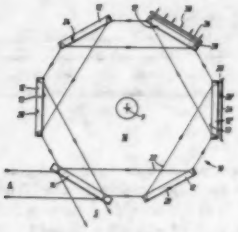
Benny A. Greene, Fadden, Australia, assignor to Electro Optic Systems Pty. Ltd., New South Wales, Australia

Continuation of Ser. No. 86,125, Jun. 4, 1987, abandoned. This application May 30, 1989, Ser. No. 358,521

Claims priority, application Australia, Oct. 4, 1985, 2711/85; Oct. 4, 1985, 2712/85; PCT Int'l Appl., Oct. 4, 1985, PCT/AU86/00291

Int. Cl.[5] H01S 3/083, 3/03, 3/07

U.S. Cl. 372—94 21 Claims



1. Laser beam processing apparatus comprising;

a body providing a generally cylindrical bounding structure for a cavity;

means to recover a laser beam from the cavity;

reflective means including at least five substantially flat reflective interfaces together forming a reflective structure of polygonal cross section about said cavity arranged to define in said cavity a light path for said laser beam which is generally polygonal as viewed from an end of the cavity; and laser material disposed in said path and arranged in plural thin segments in front of the respective interfaces to define said cylindrical bounding structure,

wherein said reflective interfaces and said thin segments are so arranged that said light path traverses the thin dimension of each of said segments.

4,945,548

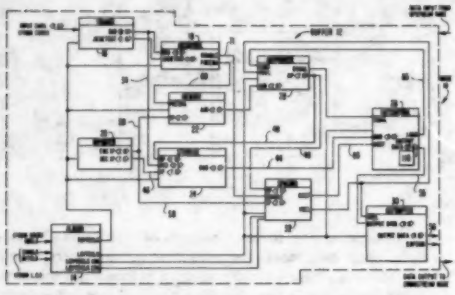
METHOD AND APPARATUS FOR DETECTING IMPENDING OVERFLOW AND/OR UNDERRUN OF ELASTICITY BUFFER

John R. Iannarone, Tewksbury, Mass., and Bruce W. Thompson, Mount Vernon, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 187,208, Apr. 28, 1988, Pat. No. 4,878,219. This application Oct. 14, 1988, Ser. No. 257,907

Int. Cl.[5] H04L 25/20, 7/00

U.S. Cl. 375—4 88 Claims



1. A parallel asynchronous elasticity buffer in a repeater node for transferring data in a data communication system, the data communication system including a plurality of nodes coupled in a network for transferring frames of data from a source node to a destination node through the repeater node, wherein the repeater node receives a plurality of bits of data in a frame from an upstream node and transmits the plurality of bits of data in the frame to a downstream node, and wherein each node in the network transmits data in synchronism with an independent clock, the elasticity buffer comprising:

receiving means for providing in parallel format, in response to a transmit multibit clock signal that is in synchronism with an independent clock of the upstream node, a multibit data unit received from the upstream node;

storage means including a fixed number of multibit storage elements, coupled to the receiving means, for storing the multibit data unit in parallel format in one of the storage elements, wherein each storage element has a unique address;

transmitting means, coupled to the storage means, for outputting in parallel format, in response to a local multibit clock signal that is in synchronism with the independent clock of the repeater node, one of the multibit data units stored in the storage means;

write pointer means, coupled to the storage means, for selecting as a write address the address of a storage element to store the next multibit data unit provided by the receiving means;

read pointer means, coupled to the storage means, for selecting as a read address the address of a storage element to provide the next multibit data unit output by the transmitting means, wherein each multibit data unit is output in first-in, first-out order;

initialization means for initializing the elasticity buffer to prevent simultaneous selection of the same address as a read address and a write address, wherein in response to initialization, a write address is selected as a read address after a predetermined delay; and

detection means for detecting whether an error condition corresponding to a write overflow or read underrun of a storage element is impending by determining whether the same address is selected as the write address and as the read address during an overlap time period having a duration equal to a threshold time period.

4,945,549

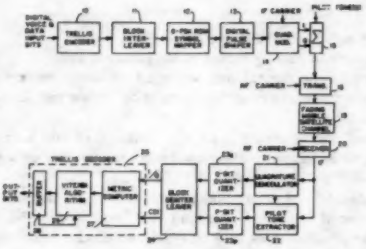
TRELLIS CODED MODULATION FOR TRANSMISSION OVER FADING MOBILE SATELLITE CHANNEL

Marvin K. Simon, La Canada, and Dariush Divsalar, Pacific Palisades, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 929,876, Nov. 13, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 246,032

Int. Cl.[5] H04L 27/18

U.S. Cl. 375—53 6 Claims



1. A method of communication with a mobile receiver over a fading mobile-satellite channel for digital coded voice and data comprising the steps of trellis coding said data at a transmitter, block interleaving said trellis coded data, and multiple phase-shift-keyed signaling the trellis coded and block inter-

leaved data with constant amplitude and distinct phase spacing in a signal set of phases greater than four, and thereafter quadrature modulating the result on an IF carrier and modulating the modulated IF carrier on an RF carrier for transmission through said mobile-satellite channel and including the step of inserting two pilot tones in the modulated IF carrier for use in synchronous demodulation of the IF carrier at said mobile receiver, and further including the steps at said mobile receiver of extracting said pilot tones, using said pilot tones for synchronous demodulation of said IF carrier to coherently detect received trellis coded data, block deinterleaving detected trellis coded data, and decoding the deinterleaved trellis coded data, said demodulating step including the steps of recovering information from extracted pilot tones for use as side information in said deinterleaved trellis decoding step.

4,945,550

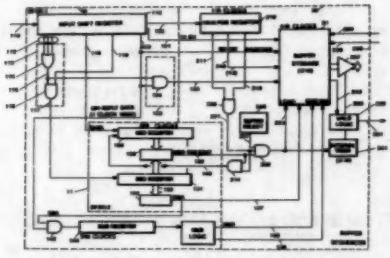
ATCRBS/SIF/TCAS REPLY DECODER

William E. Krause, Timonium, and Norman R. Sanford, Cockeysville, both of Md., assignors to Allied-Signal Inc., Morris Township, N.J.

Filed Apr. 7, 1989, Ser. No. 334,890

Int. Cl.[5] H03K *5/14*

U.S. Cl. 375—94 **18 Claims**



1. A decoder for separating pulse coded messages from a serial pulse stream composed of variably spaced pulses of uniform width, said messages being identified by first and second pulses of said stream which are separated by a first predetermined amount of time and containing information pulses which are spaced between said first and second pulses by integral multiples of a second predetermined amount of time, comprising:

a first serial storage means having an input terminal receiving said serial pulse stream and propagating said stream forward towards an output terminal thereof;

a second serial storage means having an input terminal receiving the pulse stream from said output terminal of said first storage means and propagating the stream forward;

a third serial storage means having an input terminal at which the pulses of said stream propagating through said first storage means are applied prior to the appearance of such pulses at said output terminal of said first storage means,

said third storage means propagating forward the pulse stream applied to said input terminal thereof;

a plurality of buffer storage means;

means for detecting the presence in said second storage means of first and second pulses having said first predetermined time spacing therebetween to provide a first bracket decode signal;

means for providing parallel output of all pulses contained in said second storage means having spacings from said first and second detected pulses which are integral multiples of said second predetermined amount of time, said output pulses comprising a message;

means controlled by said first bracket decode signal to enable the loading of one of said buffer storage devices with said message provided by said parallel output means; and

means for deleting from said third storage device all pulses therein which correspond to pulses provided by said parallel output means.

4,945,551

SOFT X-RAY LITHOGRAPHIC SYSTEM

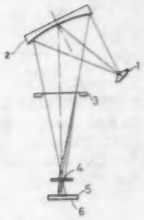
Hideki Makabe, and Kenji Iwahashi, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 44,251, Mar. 11, 1987, abandoned. This application Nov. 14, 1989, Ser. No. 436,135

Claims priority, application Japan, Jul. 19, 1985, 60-160785

Int. Cl.[5] G21K *5/00*

U.S. Cl. 378—34 **5 Claims**



1. A soft X-ray lithographic system for making a reduced copy of a patttern comprising:

(a) means for emitting a beam of soft X-rays;

(b) a spherical concave reflector, which convergently projects the beam of soft X-rays from the emitting means through a pattern to be copied; and

(c) a Fresnel zone plate, located at a point where the beam of soft X-rays convergently through the pattern to be copied is converged, which focuses the bean of soft X-rays convergently projected through the pattern onto a resist.

4,945,552

IMAGING SYSTEM FOR OBTAINING X-RAY ENERGY SUBTRACTION IMAGES

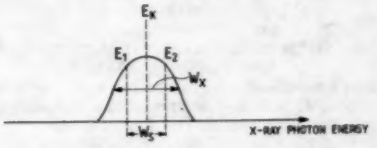
Ken Ueda, Ome; Keiji Umetani, Fuchu, and Yoshio Suzuki, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,987

Claims priority, application Japan, Dec. 4, 1987, 62-305625; Jan. 22, 1988, 63-10648

Int. Cl.[5] H05G *1/64*

U.S. Cl. 378—99 **13 Claims**



1. An imaging system for selectively depicting the distribution of a target element injected into a subject as an energy subtraction image, comprising:

a source for irradiating a radiation beam toward said subject;

an energy selecting means for selecting quasi-monoenergetic X-rays having photon energy in a range extending above and below an absorption edge of said target element from said radiation beam;

a filter that is disposable in an optical path of said radiation

beam which irradiates said subject, said filter containing said target element and having the function of substantially cutting X-rays having photon energy levels higher than said absorption edge;

an X ray image detecting means disposed behind said subject;

a control means for controlling said filter and said X-ray image detecting means such that a first image of said subject by means of said quasi-monoenergetic X-rays irradiated when said filter is removed and a second image of said subject by means of said quasi-monoenergetic X-rays irradiated when said filter is inserted are successively obtained; and

an image acquisition and processing means containing a recording means for recording the images obtained by said X-ray image detecting means, said image acquisition and processing means calculating an energy subtraction image using said first and said second images which have been recorded.

4,945,553

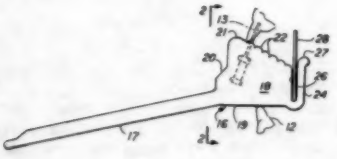
INTRA-ORAL RADIOGRAPHIC FILM HOLDER

Timothy G. Willis, 310 Evergreen, Yreka, Calif. 96097

Filed Apr. 10, 1989, Ser. No. 335,230

Int. Cl.[5] G03B *42/02*

U.S. Cl. 378—168 **8 Claims**



1. A radiographic film packet holder comprising a bite block having first and second parallel sides, said sides having converging top and bottom surfaces shaped and positioned to fit between the upper and lower teeth of a patient so that the patient may clamp said bite block between the teeth, a distal end perpendicular to said sides, a recess formed in said block bounded by said distal end and said sides and shaped to accept the exposed end of a root canal file protruding from one of the teeth of the patient, retainer means on the lingual end of said bite block shaped to receive and retain against unintentional dislodgment a portion of a film packet and to retain said packet positioned lingually of a selected tooth and parallel to said distal end, and a handle fixed to and extending from said block in a direction to extend out between the lips of the patient.

4,945,554

TEST CIRCUIT ARRANGEMENT FOR COMPUTER-CONTROLLED COMMUNICATIONS SWITCHING SYSTEMS

Ruediger Krause, Berlin, and Reinhard Foshag, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,569

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3824250

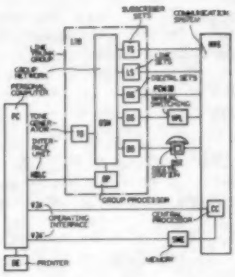
Int. Cl.[5] H04M *3/28*; H04Q *1/22*

U.S. Cl. 379—10 **5 Claims**

1. A test circuit arrangement for testing computer-controlled communications switching systems each respectively having a central network and a central processor unit, as well as having a plurality of subscriber sets and/or line sets connectable to the network for analog and/or digital information transmission that, in combination with the central processor unit, are respectively under the control of a group processor unit adapted to the plurality of subscriber sets and/or line sets, comprising:

a line trunk group configuration of the computer-controlled communications switching system, the line trunk group configuration being allocated to a single group processor unit and being formed of subscriber sets and/or line sets;

the group processor unit connected to a personal computer unit via an interface unit (HDLC);



the personal computer unit connected via a first operating interface unit to the central processor unit that controls an operating system of the communication switching system; and

a manual switching position device and a digital station each of which is controllable by the group processor unit via a digital set and each of which being directly connected t the communications switching system to be tested.

4,945,555

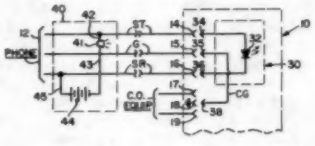
METHOD AND MEANS FOR REMOTE TESTING OF UNUSED TELEPHONE LINES

Christopher R. Teumer, and Mark A. Mendes, both of Rochester, N.Y., assignors to Rochester Telephone Corporation, Rochester, N.Y.

Filed Oct. 6, 1989, Ser. No. 418,241

Int. Cl.[5] H04B *3/46*

U.S. Cl. 379—21 **16 Claims**



15. Apparatus for testing a pair of unused telephone lines emanating from the main frame of a telephone central office, comprising,

a first device removably mounted in said main frame and releasably connecting said unused pair of lines together to permit DC current flow in one direction only through said lines,

a second, portable device disposed releasably to be connected across said unused lines at a point remote from said main frame,

said second device including a direct current power supply in series with an electrical signal generator operative to produce a signal when DC current flows therethrough, and

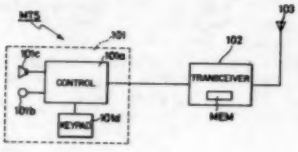
means for selectively connecting said second device across said lines in two different modes, in one of which said

power supply has a first polarity with respect to said lines, and in the other of which said polarity is reversed.

4,945,556
METHOD OF LOCKING FUNCTION OF MOBILE TELEPHONE SYSTEM

Makoto Namekawa, Iwaki, Japan, assignor to Alpine Electronics Inc., Japan

Continuation of Ser. No. 102,254, Sep. 28, 1987, abandoned, which is a continuation of Ser. No. 881,905, Jul. 3, 1986, abandoned. This application Nov. 9, 1988, Ser. No. 270,423
Claims priority, application Japan, Jul. 9, 1985, 62-150647
Int. Cl.[5] H04M *1/66*
U.S. Cl. 379—58 6 Claims



1. A method of selectively locking a plurality of functions of a mobile telephone system having an input keypad, a memory, a control portion for controlling operation of the functions of the mobile telephone system, and an on/off power switch, comprising the steps of:

storing, in advance, a first lock code in the memory;

storing, in advance, at least one, second lock code in the memory;

providing, in the control portion, all of said functions of the mobile telephone system in a first operational mode, and less than the total number of said functions of the mobile telephone system in a second operational mode;

assigning said first lock code to a first user who is to be allowed access to all of said functions of said mobile telephone system;

assigning a second lock code to a second user who is to have access to a different set of said functions in the form of said less than the total number of said functions;

locking all of said functions of said mobile telephone system when said on/off power switch is turned on;

comparing an input lock code keyed in by a user to determine if said first lock code or said second lock code has been provided by the user;

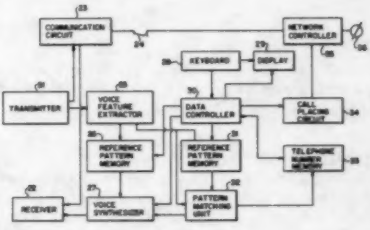
unlocking all of said functions of said mobile telephone system to allow unlimited use by said user in the first operational mode if the first lock code assigned to said first user is provided;

unlocking said different set of said functions corresponding to the previously assigned second lock code of a said second user to allow use of said different set of said functions in the second operational mode if said assigned second lock code is provided.

4,945,557
VOICE ACTIVATED DIALING APPARATUS

Kunihiro Kaneuchi; Toshiki Kawamoto, and Tomofumi Nakatani, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

Division of Ser. No. 203,825, Jun. 8, 1988, abandoned. This application Apr. 5, 1989, Ser. No. 333,698
Claims priority, application Japan, Jun. 8, 1987, 62-143667; Jun. 8, 1987, 62-143668; Jun. 8, 1987, 62-143669; Jun. 8, 1987, 62-143670; Jun. 8, 1987, 62-143671; Jun. 8, 1987, 62-143673; Jun. 12, 1987, 62-147610; May 20, 1988, 63-124738
Int. Cl.[5] H04M *1/27, 1/56*
U.S. Cl. 379—67 17 Claims



1. A voice activated dialing apparatus, comprising:

first storing means for storing a plurality of telephone numbers;

second storing means for storing a plurality of voice data, each of which corresponds to one of said plurality of telephone numbers;

generating means for generating voices in accordance with at least one of said plurality of voice date stored in said second storing means;

first selecting means for selecting at least one of said plurality of voice data stored in said second storing means to be supplied to said generating means for generating a voice of each of said selected voice data;

second selecting means for selecting one voice data among said selected voice data while said selected voice date is used by said generating means to generate voices one after another; and

outputting means for outputting a dial signal of a telephone number which corresponds to said one voice data selected by said second selecting means.

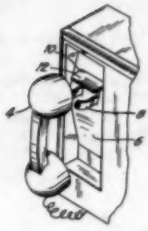
4,945,558
TELEPHONE SET

David C. Deaville, West Chester, Pa., assignor to Mars Incorporated, McLean, Va.

Filed Oct. 19, 1988, Ser. No. 259,887
Claims priority, application United Kingdom, Oct. 19, 1987, 8724454
Int. Cl.[5] H04M *17/02*
U.S. Cl. 379—144 2 Claims

1. A telephone set having a base unit and a handset which is removable from a rest position on the base unit to make a telephone call and replaceable in the rest position following the call, and means for receiving a telephone enabling element which must be inserted into the receiving means to enable a call to be made and should be removed from the receiving

means on completion of the call, characterized by means for defining a second, unstable or insecure position for the handset



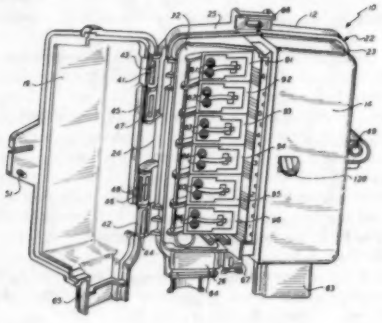
on the base unit, said means being operative when the telephone enabling element is present in the receiving means.

4,945,559

TELEPHONE NETWORK INTERFACE APPARATUS

Thomas J. Collins, Wall; Pina Schneider, Ocean Township, Ocean County; Anthony L. Nieves, Bradley Beach, and Thomas G. Graham, Ocean, all of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.

Continuation of Ser. No. 139,590, Dec. 30, 1987, abandoned.
This application Nov. 7, 1989, Ser. No. 433,572
Int. Cl.[5] H04M 9/00
U.S. Cl. 379—399 23 Claims



1. Telephone network interface apparatus for interconnecting incoming telephone company wiring to subscriber premises wiring, comprising:

a base including a bottom and an outwardly extending wall circumscribing said bottom, said wall including opposed first and second wall portions, said bottom and said wall providing a compartment divided generally into opposed first and second compartment portions, said first compartment portion adjacent said first wall portion and said second compartment portion adjacent said second wall portion, said first compartment portion for having first terminals mounted therein for connection to said telephone company wiring and said second compartment portion for having second terminals mounted therein for connection to said subscriber premises wiring;

a telephone company cover mounted pivotally to said second wall portion and for overlying said compartment, said telephone company cover including opposed first and second portions, said first portion being solid and for overlying and closing said first compartment portion and said second dover portion provided with an opening for overlying and exposing said second compartment portion to the exterior upon said telephone company cover being closed, said telephone company cover for being fastened only to said base, and said apparatus including first fastening means for fastening said telephone company cover only to said base;

a solid subscriber cover mounted pivotally to said second wall portion and for overlying only said second portion of said telephone company cover and for overlying and closing only said second compartment portion, said subscriber cover for being fastened only to said telephone company cover and said apparatus including second fastening means for fastening said subscriber cover only to said telephone company cover; and

said apparatus further comprising said first terminals and wherein said first terminals comprise:

a ground buss mounted to said base in said first compartment portion;

a plurality of electrical protection devices mounted on and electrically connected to said buss;

a plurality of pairs of telephone company wiring terminals mounted on said electrical protective devices and for connection to said telephone company wiring; and

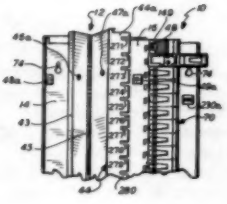
said buss provided with a separate terminal for connection to earth ground whereby said bus remains grounded while said telephone company wiring is being connected and disconnected to and from said pairs of telephone company wiring terminals.

4,945,560

TELEPHONE NETWORK INTERFACE APPARATUS

Thomas J. Collias, Wall Township, Monmouth County, and Peter Quintana, Brick, both of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.

Continuation-in-part of Ser. No. 187,935, Apr. 29, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,850
Int. Cl.[5] H04M 9/00
U.S. Cl. 379—399 12 Claims



12. Telephone network interface apparatus, comprising:

enclosure means providing a splice chamber for receiving a telephone network cable including a plurality of incoming telephone lines, a terminal chamber having lightning protectors and a plurality of pairs of telephone terminals mounted therein, and a network interface section having a plurality of interface jacks and pairs of subscriber terminals mounted thereon;

an interface plug connected to each pair of said subscriber terminals and for being removably received within an associated one of said interface jacks, each of said interface jacks for being connected to one of said telephone terminals and thereby to one of said incoming telephone lines and each pair of said subscriber terminals for being connected to a subscriber premises line, upon each of said interface plugs being removed from its associated interface jack a demarcation point being provided between one of said telephone lines and one of said subscriber premises lines whereby the plug of an operating telephone may be plugged into said associated interface jack to facilitate determination of whether a fault exists on said one incoming telephone line or said one subscriber premises line;

separate splice chamber and terminal chamber doors

mounted pivotally on said enclosure means, said splice chamber door for covering and closing only said splice chamber and said terminal chamber door for covering and closing only said terminal chamber;

first fastening means for fastening said splice chamber door closed only over said splice chamber and second fastening means for fastening said terminal chamber door closed only over said terminal chamber; and

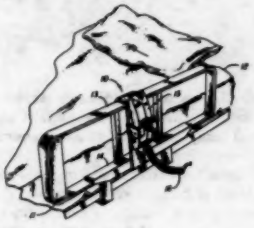
telephone network interface apparatus mounting means for mounting said apparatus on a support surface.

4,945,561

TELEPHONE HANGER FOR HOSPITAL BED

Robert A. Rioux, Jr., 6175 Crestview Rd., North Syracuse, N.Y. 13212

Filed Jan. 26, 1989, Ser. No. 301,609
Int. Cl.[5] H01M *1/04*
U.S. Cl. 379—454 **5 Claims**



1. In combination, a one-piece telephone instrument and a hospital room telephone support for supporting the one-piece telephone instrument from a hospital bed rail assembly of the type that has upper and lower horizontal rails spaced a distance apart; the telephone instrument comprising an elongated housing having on a front surface thereof an earpiece, a mouth piece, and a hook switch which when depressed places the instrument in an on-hook condition, and when released places the instrument in an off-hook condition, and

the telephone support comprising

a two-part bracket for mounting on the bed rail assembly, including an upper plate having a top edge and upper hook means at said top edge and extending rearwardly therefrom to engage the upper rail, a lower plate slidably engaging said upper plate and having a lower edge and lower hook means at said lower edge to engage the lower rail, said upper and lower plates together defining a rear wall, and engaging means on one surface of said upper plate and on a mating surface of said lower plate for holding the upper and lower plates at a desired longitudinal position with respect to each other;

a support shelf extending outward from a front surface of one of said plates; and

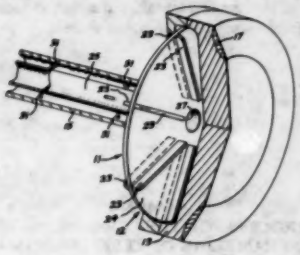
a pair of retaining members disposed on opposite side edges of one of said plates and extending forward therefrom, each having a front flange that extends toward the other of the retaining members, said retaining members being formed of a resilient semi-rigid material with the front flanges being angled inward towards said rear wall, the rear wall and the retaining members defining a retaining channel for retaining the telephone instrument, the latter being slidably removable from and insertable into the channel and against said support shelf with said angled-inward front flanges yieldably urging said instrument against said rear wall so that the hook switch is held depressed against said rear wall when said instrument is retained in said channel and is resting on said support shelf.

4,945,562

X-RAY TARGET COOLING

Fred W. Staub, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,149
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—130 **10 Claims**



1. A rotatable anode for an X-ray tube comprising:

a hollow rotatable anode wheel having two circular faces, one of said faces having a bevelled edge for a target region;

a circular baffle having first and second sides situated concentrically inside said hollow anode wheel, said circular baffle having means for imparting a tangential velocity to a liquid on either side of the baffle, the outer perimeter of said circular baffle spaced away from the interior of said anode wheel said second side of said circular baffle having means situated thereon for creating operation between a forced and a free vortex condition in liquid in the vicinity of the disc periphery;

means for supplying cooling liquid to the central portion of the first side of said baffle;

means for removing cooling liquid from the central portion of the second side of said baffle, said second side of said baffle adjacent to the face of said hollow rotatable anode wheel having the bevelled edge; and

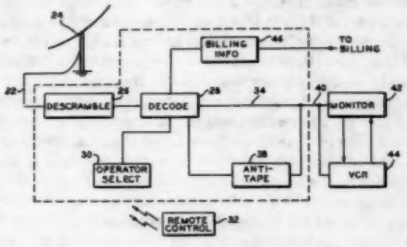
structural means for rotating said baffle when said anode wheel is being rotated.

4,945,563

VIDEO SYSTEM AND METHOD FOR CONTROLLED VIEWING AND VIDEOTAPING

Edwin T. Horton, Ballwin, Mo., and Edward W. Smith, Lake Arrowhead, Calif., assignors to Satellite Technology Services, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 927,169, Nov. 5, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 247,844
Int. Cl.[5] H04N *7/167*; H04H *1/02*
U.S. Cl. 380—5 **20 Claims**



1. A video reception system for receiving encrypted pre-

mium TV programs and formatting said TV programs to control videotaping thereof, said programs being encoded to indicate that recording thereof is either permitted or not permitted, said system comprising a receiver, the receiver including: means to descramble the encrypted TV program, means to decode the program code, means to permit operator selection of a program code, means to format said TV program for unrestricted viewing and taping, and means to format said TV program for viewing but not taping thereof.

4,945,564

PROCESS FOR THE SCRAMBLING AND DESCRAMBLING OF TELEVISION IMAGES

Victorion Christian, Rennes, and Guionnet Jacques, Vezin le Coquet, both of France, assignors to Etablissement Public de Diffusion dit "Telediffusion de France", France

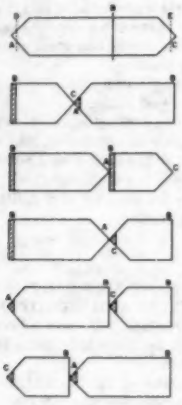
Continuation of Ser. No. 170,136, Mar. 14, 1988, abandoned, which is a continuation of Ser. No. 879,259, Jun. 27, 1986, abandoned. This application Oct. 5, 1989, Ser. No. 293,605

Claims priority, application France, Jul. 2, 1985, 85 10194

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—14 **5 Claims**



1. A scrambling and descrambling process for a MAC signal wherein the useful signal is a sampled video signal, in which at least a part of the said useful signal is spliced into two adjacent segments (AB, BC) each of them having at least two states, the splicing point (B) between the two segments being defined in a pseudo-random manner which is synchronous at transmission and reception, characterized in that at transmission at each line and in a pseudo-random manner, a scrambling scheme is selected from two possible schemes, that is a local reversing of a second of said two segments or a reversing of the second segment followed by permutations with a first of the two segments, and in that upon reception, the inverse processing of the process which occurred at transmission is applied in order to reintroduce intelligibility to the video signal, that is a local reversing of second received signal or a reversing of the first received signal followed by the permutation with the second received segment.

4,945,565

LOW BIT-RATE PATTERN ENCODING AND DECODING WITH A REDUCED NUMBER OF EXCITATION PULSES

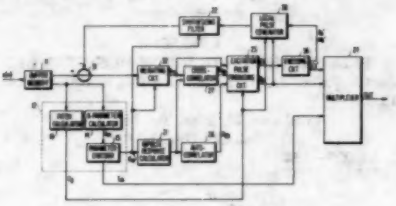
Kazunori Ozawa, and Takashi Araseki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 751,818

Claims priority, application Japan, Jul. 5, 1984, 59-139634; Jul. 10, 1984, 59-143017

Int. Cl.[5] G10L *7/02*

U.S. Cl. 381—38 **7 Claims**



3. An encoder for encoding a discrete pattern signal into an output code sequence, said discrete pattern signal including pitch pulses and being composed of a succession of segments, said encoder comprising:

extracting means for extracting, from said discrete pattern signal, a pitch parameter representative of a pitch period of said pitch pulses in each of said segments of said discrete pattern signal and a spectral parameter specifying short time spectrum envelope characteristics of said discrete pattern signal;

calculating means for successively calculating excitation pulses for a first subframe and excitation pulses for a second subframe following said first subframe;

calculating means for calculating first and second signal-to-noise ratios for the first and second subframes, respectively;

determining means for determining a ratio R of said second signal-to-noise ratio to said first signal-to-noise ratio;

comparing means for comparing the ratio R to a predetermined threshold value Th;

generating means for generating a repeat signal for the second subframe when the ratio, R, is not greater than the threshold, Th, so as to repeat the excitation pulses of the first subframe for the second frame, and otherwise generating modified excitation pulses calculated from the first and second subframes, the excitation pulses of the first subframe and the modified excitation pulses being produced as practical excitation pulses which are specified by amplitudes and locations;

calculating means for calculating said amplitudes and said locations of the practical excitation pulses; and

signal producing means for combining said amplitudes and said locations of the excitation pulses and said spectral parameter to produce said output code sequence.

4,945,566

METHOD OF AND APPARATUS FOR DETERMINING START-POINT AND END-POINT OF ISOLATED UTTERANCES IN A SPEECH SIGNAL

Dieter Mergel; Hermann Ney, both of Hamburg, and Horst H. Tomaschewski, Stuvenborn, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1988, Ser. No. 274,093

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739681

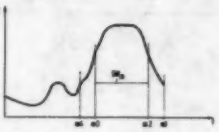
Int. Cl.[5] G10L *5/00*

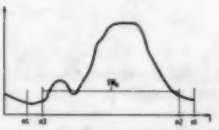
U.S. Cl. 381—41 **14 Claims**

1. In a method of determining a start-point and an end-point of a word signal corresponding to an isolated utterance in a

speech signal by establishing an extreme value in a sequence of digital values derived from the speech signal, taking into account those values surrounding the extreme value of the signal variation and a threshold value, the improvement comprising:

assigning a plurality of previously, sequentially received digital values to three adjacent time windows, a first window (end-window) including a predetermined first number (B_E) of the digital values which arrived last, a second window (signal window) including a second number (B_{S1}) of digital values, said second number varying between a predetermined first value and a predetermined higher second value, and a third window (start-window) including a predetermined third number (B_F) of digital values, forming for each new digital value a threshold value (thr) from the digital values in the first window and, consecutively for each value (1) of the second number (B_{S1}), from the digital values of the third window, decreasing each digital value of the second window by said threshold value, comparing the sum of the digital values thus decreased for each of said second number to the highest previous sum similarly produced and, depending on the result of said comparison, storing said sum together with positional data indicating the position of the second window in the sequence of digital values, and wherein the positional data stored last indicate the start-point and the end-point of the word signal.





4,945,567
METHOD AND APPARATUS FOR SPEECH-BAND SIGNAL CODING

Kazunori Ozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 275,703, Nov. 25, 1988, abandoned, which is a continuation of Ser. No. 708,623, Mar. 5, 1985, abandoned. This application Jan. 10, 1990, Ser. No. 462,981

Claims priority, application Japan, Mar. 6, 1984, 59-42307; Apr. 4, 1984, 59-67114

Int. Cl.[5] G10L 5/00

U.S. Cl. 381—49 **13 Claims**

1. A method of coding a speech signal in which the speech signal in each frame period is represented by a plurality of excitation pulses and spectral parameters, said excitation pulses representing an excitation signal of said speech signal and having amplitude information and different location information and said spectral parameters representing spectrum information of said speech signal, said method comprising:

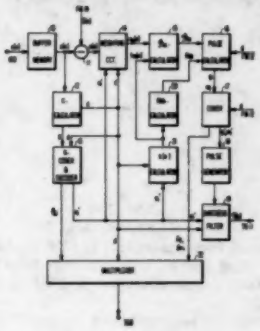
a pulse determining step for determining said excitation pulses from said speech signal in a short time interval which is not shorter than said frame period;

a spectrum determining step for determining said spectral parameters from said speech signal in said frame period;

a decision step for deciding voiced and unvoiced states of said speech signal in response to the spectral parameters determined in said frame period, said decision step thereby generating a judgment signal indicative of which of said voiced and unvoiced states said speech signal has in said frame period;

a setting step for setting the number of said excitation pulses at first and second predetermined numbers L1 and L2 (where L1 and L2 are the numbers of said excitation pulses in said frame period and L2>L1) when said judgment signal indicates the voiced and unvoiced states, respectively; and

a coding step for coding at least said excitation pulses and spectral parameters into a coded signal.



4,945,568
METHOD OF AND DEVICE FOR DERIVING FORMANT FREQUENCIES USING A SPLIT LEVINSON ALGORITHM

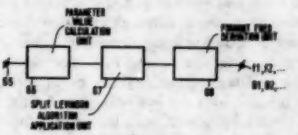
Leonardus F. Willems, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,669

Claims priority, application Netherlands, Dec. 12, 1986, 8603163

Int. Cl.[5] G10L 9/04

U.S. Cl. 381—50 **9 Claims**



5. A device for determining formant frequencies from a part of a speech signal located within a given time interval, comprising:

an input terminal for receiving a speech signal,

a first unit for deriving from said part of the speech signal respective parameter values for successive instants located within the given time interval, said first unit having an input coupled to the input terminal and an output coupled to an input of a second unit,

said second unit including means for determining a polynomial of a given order from the parameter values and having an output coupled to an input of a third unit, and

said third unit includes means for deriving the formant frequencies from the given polynomial, and having an output for supplying the formant frequencies, characterized in that the second unit performs a number of recursion steps in each of which a Split Levinson algorithm is performed to derive a singular predictor polynomial from the parameter values, the singular predictor polynomial derived in a recursion step having a higher order than the singular predictor polynomial determined in a preceding recursion

step, wherein in a recursion step the second unit derives a number of zeros of the singular predictor polynomial determined in said recursion step by using zeros calculated during a previous recursion step, and in that the third unit derives the formant frequencies from the zeros of the singular predictor polynomial obtained in the last recursion step.

4,945,569

HEARING AID

Jaromir Kulman, Friedstrasse 25, CH-8800 Thalwil, Switzerland

Filed Jan. 26, 1989, Ser. No. 302,418

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802250

Int. Cl.[5] H04R *25/02*

U.S. Cl. 381—68.6 **10 Claims**

1. A hearing aid installable in an auricle and having an auricular part consisting of plastic and a conical auditory canal part slidable into the auditory canal presenting at an end side at least one sound emergence opening, and containing electrical components namely a microphone, an amplifier a receiver, and a battery and a sound-volume regulator, wherein the sound emergence opening is arranged in a tube section projecting beyond the end side of the auditory canal part and the tube section is bridged by a curved yoke joined with a wall of the auditory canal part, which yoke leaves free over the tue section a clear distance of at least 0.9 mm for accommodating the size of granule formation of earwax.

4,945,570

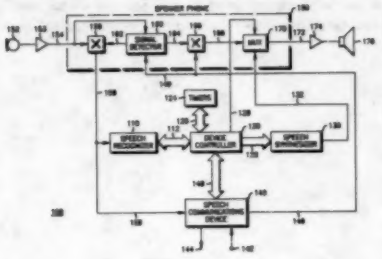
METHOD FOR TERMINATING A TELEPHONE CALL BY VOICE COMMAND

Ira A. Gerson, Hoffman Estates, and Brett L. Lindsley, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 105,151, Oct. 2, 1987, abandoned. This application Aug. 25, 1989, Ser. No. 399,341

Int. Cl.[5] H04B *1/46*

U.S. Cl. 381—110 **43 Claims**



1. A speech communications device having a voice command system for controlling a voice communication path established by said speech communications device, said voice communication path being controlled by a command signal provided by said control system in response to user-spoken command words, said control system comprising:

speech recognition means for recognizing sequential first and second user-spoken utterances at least during the time said voice communication path is established, said speech recognition means including;

first means for recognizing, during the time said voice communication path is established, said first user-spoken utterance as one corresponding to a first predetermined command word, and for producing a first detect signal in response to such recognition,

second means for recognizing said second user-spoken utterance as one corresponding to a second predetermined command word, for producing a second detect signal if said second predetermined command word is recognized, and for cancelling said recognition of said first predetermined command word if said second predetermined command word is not recognized; and

decision means for providing said command signal in response to said second detect signal occurring within a predetermined recognition time interval after said first detect signal.

DESIGN PATENTS

GRANTED JUL. 31, 1990

ERRATA

For CLASS	See PATENT NO.
D15-001	309,606
D22-134	309,644
D22-141	309,650
D26-051	309,661
D13-146	309,664

DESIGNS

JULY 31, 1990

309,520

LICORICE STRIP OR SIMILAR ARTICLE

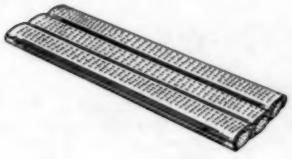
Charles Thomassen, Tietjerk; Klaas Kingma, De Tike, and Reinder Huisman, Tietjerk, all of Netherlands, assignors to R.G. Van Slooten's Suikerwerkfabriek B.V., VD Irnsum, Netherlands

Filed Jun. 15, 1987, Ser. No. 67,720

Claims priority, application Hague, Dec. 17, 1986, 61688-00

Term of patent 14 years

U.S. Cl. D1—121



309,521

RAVIOLI

John Eureka, Medina; Linda K. Law, Warrensville Heights, and David C. Marsh, Chagrin Falls, all of Ohio, assignors to The Stouffer Corporation, Solon, Ohio

Filed May 12, 1987, Ser. No. 48,785

Term of patent 14 years

U.S. Cl. D1—126

309,522

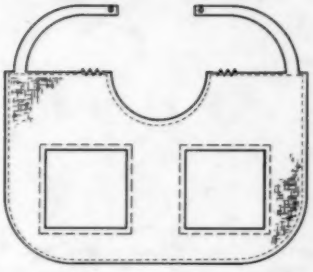
BREAST FEEDING BIB

Darlene R. Merritt, 2767 Kesey La., San Jose, Calif. 95132

Filed Jul. 14, 1986, Ser. No. 885,522

Term of patent 14 years

U.S. Cl. D2—229



309,523

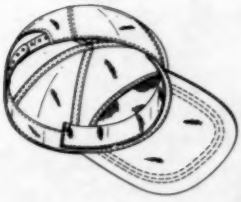
COMBINED CAP AND SWEATBAND

James B. Martin, P.O. Box 4209, Evansville, Ind. 47711

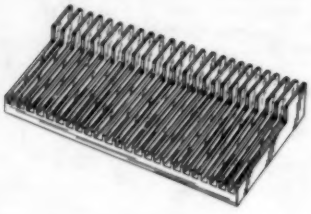
Filed Jul. 28, 1986, Ser. No. 889,899

Term of patent 14 years

U.S. Cl. D2—244



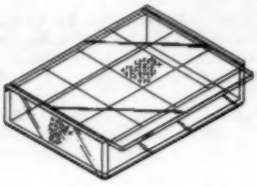
309,524
DISC STORAGE RACK
Robert A. Egly, 31 Belcourt S., Newport Beach, Calif. 92660, and Patrick Sullivan, 1752 Brookshire Ave., Tustin, Calif. 92680
Filed Jan. 16, 1987, Ser. No. 4,536
Term of patent 14 years
U.S. Cl. D3—35



309,525
KEY-RING
Claude Grossiord, Annecy, France, assignor to S. T. Dupont, Paris, France
Filed Jun. 4, 1986, Ser. No. 870,689
Claims priority, application France, Mar. 5, 1986, 861077
The portion of the term of this patent subsequent to Dec. 12, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—61

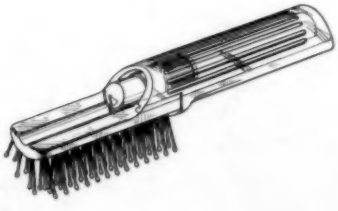
309,526
KEY RING
Gary L. Hofmann, 7343 W. 83rd St., Los Angeles, Calif. 90045
Filed Mar. 3, 1988, Ser. No. 163,461
Term of patent 14 years
U.S. Cl. D3—61

309,527
DENTAL MATERIALS BOX
Bruce A. Singer, 1520 Beecham Dr., Ambler, Pa. 19002
Filed Sep. 29, 1986, Ser. No. 913,147
Term of patent 14 years
U.S. Cl. D3—78



309,528
TONGUE BRUSH
Anthony Valenti, P.O. Box 726, Marstons Mills, Mass. 02648
Filed Jan. 24, 1990, Ser. No. 470,044
Term of patent 14 years
U.S. Cl. D4—104

309,529
COMBINED HAIRBRUSH AND SPRAY DISPENSER
Chan Y. Kim, Closter, N.J., assignor to Bandal Enterprises, Inc., New York, N.Y.
Filed Jun. 27, 1988, Ser. No. 211,842
Term of patent 14 years
U.S. Cl. D4—116



309,530
BRUSH HANDLE
Eric Gingras, Cross Junction, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Dec. 3, 1987, Ser. No. 127,969
Term of patent 14 years
U.S. Cl. D4—138

309,531
CHAIR
Andras Dozsa-Farkas, Munich, Fed. Rep. of Germany, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 30, 1987, Ser. No. 32,089
Claims priority, application Switzerland, Dec. 30, 1986, DM/008001
Term of patent 14 years
U.S. Cl. D6—366

309,532
CHAIR
Andras Dozsa-Farkas, Munich, Fed. Rep. of Germany, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 30, 1987, Ser. No. 32,090
Claims priority, application Switzerland, Dec. 30, 1986, DM/008001
The portion of the term of this patent subsequent to Jul. 31, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

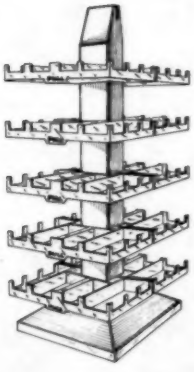
309,533
CHAIR
Andras Dozsa-Farkas, Munich, Fed. Rep. of Germany, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 30, 1987, Ser. No. 32,092
Claims priority, application Switzerland, Dec. 30, 1986, DM/008001
Term of patent 14 years
U.S. Cl. D6—366

309,534
CHAIR
Andras Dozsa-Farkas, München, Fed. Rep. of Germany, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 30, 1987, Ser. No. 32,096
Claims priority, application Switzerland, Dec. 30, 1986, DM/008001
The portion of the term of this patent subsequent to Jul. 31, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366

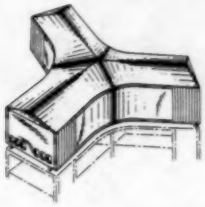
309,535
CHAIR
Robert L. Wilson, Memphis, Tenn., assignor to Chromcraft Furniture Corp., Senatobia, Miss.
Filed Mar. 30, 1987, Ser. No. 31,833
Term of patent 14 years
U.S. Cl. D6—372

309,536
VANITY TABLE
Peter Mo Yau Kee, Flat 1002, Block A, 10th Floor, Jetto Villa, 18 Broadwood Road, Happy Valley, Hong Kong
Filed Jan. 10, 1989, Ser. No. 295,566
Term of patent 14 years
U.S. Cl. D6—397

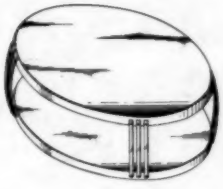
309,537
DISPLAY STAND
Arthur E. Landi, Greenwich, Conn., assignor to Display Producers, Inc., Bronx, N.Y.
Filed Nov. 4, 1987, Ser. No. 117,144
Term of patent 14 years
U.S. Cl. D6—461



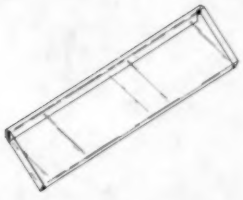
309,538
HEADER FOR A MERCHANDISING DISPLAY STAND OR THE LIKE
William Prendergast, Park Ridge, and John G. Dewees, Morristown, both of N.J., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 5, 1986, Ser. No. 938,772
Term of patent 14 years
U.S. Cl. D6—455



309,539
COFFEE TABLE
Sally S. Lewis, 8950 St. Ives Dr., Los Angeles, Calif. 90069
Filed Feb. 24, 1987, Ser. No. 17,199
Term of patent 14 years
U.S. Cl. D6—479

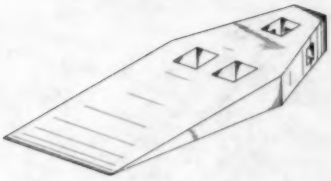


309,540
SNEEZE GUARD
J. Marshall Suttles, Elberton, and Harry E. Schoepf, Hartwell, both of Ga., assignors to Royston Corporation, Royston, Ga.
Division of Ser. No. 851,699, Apr. 14, 1986, Pat. No. Des. 302,221. This application May 16, 1989, Ser. No. 352,821
Term of patent 14 years
U.S. Cl. D6—491

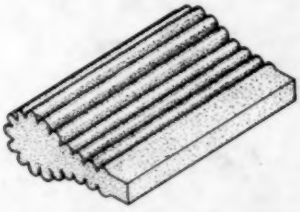


309,541
PLANT HANGER
Dale De Vries, and Dean De Vries, both of 3160 Waverly St., Vancouver, British Columbia, Canada V5S 1G2
Filed Apr. 29, 1988, Ser. No. 187,889
Claims priority, application Canada, Dec. 9, 1987, 09-12-87-2
Term of patent 14 years
U.S. Cl. D6—513

309,542
INFLATED FACE-DOWN PILLOW FOR A WOMAN
Gwendolyn Glenn, P.O. Box 15425, Richmond, Va. 23227
Filed May 2, 1988, Ser. No. 189,589
Term of patent 14 years
U.S. Cl. D6—596



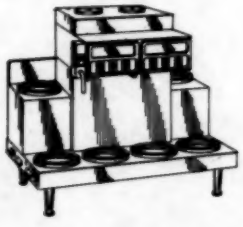
309,543
FOAMED CORE FOR A PILLOW
Larrison C. Goodman, 11924 High Valley, Dallas, Tex. 75234
Filed Jan. 20, 1987, Ser. No. 5,572
Term of patent 14 years
U.S. Cl. D6—601



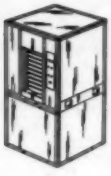
309,544
POST-SURGERY PILLOW
Olive Abriam, 11289 Del Gato Ave., San Diego, Calif. 92126
Filed Dec. 27, 1988, Ser. No. 289,752
Term of patent 14 years
U.S. Cl. D6—601

309,545
COMBINED TRAY, MUGS AND COFFEE SERVICE
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jul. 6, 1989, Ser. No. 376,258
Term of patent 14 years
U.S. Cl. D7—507

309,546
COMBINED COFFEE MAKING AND HOT WATER DISPENSING MACHINE
Raymond E. Van Camp, Rochester, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Dec. 7, 1987, Ser. No. 129,678
Term of patent 14 years
U.S. Cl. D7—308



309,547
FOOD WARMER
James R. Kane, Garden Grove, Calif., assignor to NutraCare International, Newport Beach, Calif.
Filed Jun. 1, 1988, Ser. No. 201,111
Term of patent 14 years
U.S. Cl. D7—323



309,548
FOOD BLENDER
Don R. McCloskey, Stratford, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 16, 1988, Ser. No. 168,735
Term of patent 14 years
U.S. Cl. D7—378

309,549

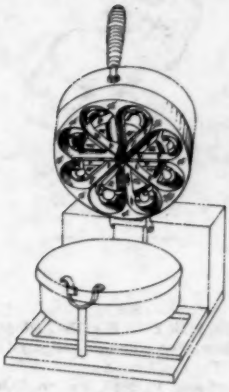
WAFFLE IRON PLATES

Donald O. Stephens, Peoria, Ill., assignor to CoBatCo., Inc., Peoria, Ill.

Filed Feb. 4, 1988, Ser. No. 152,064

Term of patent 14 years

U.S. Cl. D7—410



309,550

FOODSTUFFS CONTAINER WITH A SPOON

Ambrogio Pozzi, Gallarate, Italy, assignor to Fratelli Guzzini S.p.A., Recanti (Macerata), Italy

Filed Oct. 16, 1987, Ser. No. 109,253

Claims priority, application Italy, Apr. 27, 1987, 21464/87[U]

Term of patent 14 years

U.S. Cl. D7—505

309,551

PLATE OR SIMILAR ARTICLE

Hans-Wilhelm Seitz, Marktredwitz, Fed. Rep. of Germany, assignor to Porzellanfabrik Weiden Gebr. Bauscher Zweigniederlassung der Hutschenreuther Aktiengesellschaft, Weiden, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 907,756

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, MR V7654

Term of patent 14 years

U.S. Cl. D7—585

309,552

DISPENSER

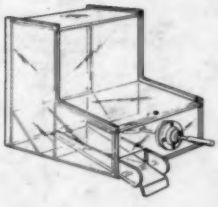
Steven Spring, Sydney, and Robert Muras, Brookvale, both of Australia, assignors to Senhill Pty. Limited, Sydney, Australia

Filed Aug. 31, 1988, Ser. No. 240,898

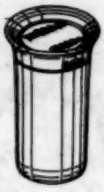
Claims priority, application Australia, Mar. 1, 1988, 0635/88

Term of patent 14 years

U.S. Cl. D7—589

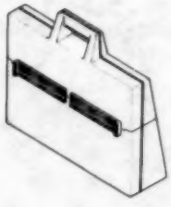


309,553
CONDIMENT SHAKER OR THE LIKE
Robert H. C. M. Duenen, Erembodegem, and Pieter J. K. De-Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Feb. 2, 1988, Ser. No. 152,596
Term of patent 14 years
U.S. Cl. D7—591



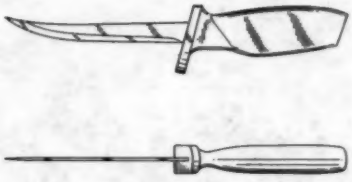
309,554
COVERED FOOD STORAGE BOWL OR THE LIKE
Edward Meisner, Edgewater, N.J., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Nov. 28, 1986, Ser. No. 936,012
Term of patent 14 years
U.S. Cl. D7—602

309,555
PORTABLE COOLER
James W. Kime, 4895 Settles Pt. NW., Suwanee, Ga. 30174
Continuation-in-part of Ser. No. 758,429, Jul. 24, 1985, Pat. No. Des. 296,497. This application Nov. 2, 1987, Ser. No. 115,358
Term of patent 14 years
U.S. Cl. D7—605

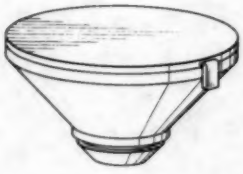


309,556
NAPKIN ARRANGER
Donna Bergeson, P.O. Box 127, Buckeye, Iowa 50043
Filed Aug. 24, 1987, Ser. No. 88,201
Term of patent 14 years
U.S. Cl. D7—633

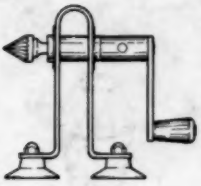
309,557
KNIFE FOR THE BONING OF MEAT
Michel Quennessen, Paris, France, assignor to Etablissements Jean PERNOT et Cie, France
Filed Aug. 10, 1987, Ser. No. 83,084
Claims priority, application France, Feb. 18, 1987, 87 1073
Term of patent 14 years
U.S. Cl. D7—693



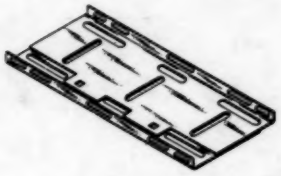
309,558
RECLOSABLE FUNNEL FIXTURE
Luay Ayyoubi, P.O. Box 8616, The Woodlands, Tex. 77387, and Travis O. Evans, 901 Sunnyside, Houston, Tex. 77076
Continuation-in-part of Ser. No. 923,297, Oct. 27, 1986, abandoned. This application Apr. 5, 1988, Ser. No. 178,995
Term of patent 14 years
U.S. Cl. D7—700



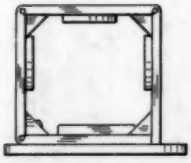
309,559
DRILL BIT SHARPENER
Daniel Vaccaro, 32 Doran Ct., Chula Vista, Calif. 92010
Filed Oct. 2, 1987, Ser. No. 106,329
Term of patent 14 years
U.S. Cl. D8—91



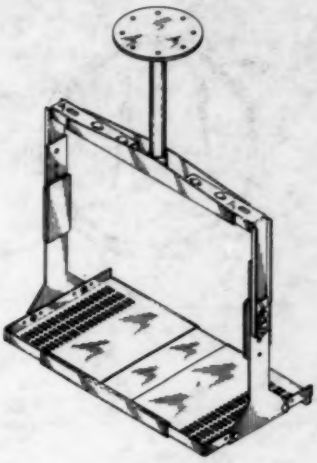
309,560
ADJUSTABLE MAILBOX MOUNTING PLATFORM
Byron A. Warlick, Lincoln, Nebr., assignor to State of Nebraska, Department of Roads, Lincoln, Nebr.
Filed Oct. 2, 1987, Ser. No. 104,872
Term of patent 14 years
U.S. Cl. D8—355



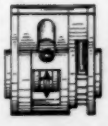
309,561
ELECTRICAL WIRING HARNESS RETAINER
Peter M. Collins, Richton Park, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Aug. 11, 1986, Ser. No. 895,252
Term of patent 14 years
U.S. Cl. D8—356



309,562
ADJUSTABLE CEILING-MOUNTED APPLIANCE SUPPORT
William L. Boscacci, and Edward L. O'Neill, both of San Leandro, Calif., assignors to Lucasey Manufacturing Corporation, Oakland, Calif.
Filed Sep. 9, 1987, Ser. No. 94,930
Term of patent 14 years
U.S. Cl. D8—373

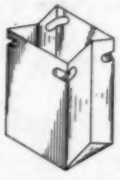


309,563
TUBE CUTTER
William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.
Filed Dec. 16, 1986, Ser. No. 942,599
Term of patent 14 years
U.S. Cl. D8—60



309,564
CONTAINER LID
Adrien P. Rayner, Wiltshire, England, assignor to CMB Packaging (UK) Limited, England
Filed Nov. 17, 1987, Ser. No. 121,825
Claims priority, application United Kingdom, May 19, 1987, 1042286
Term of patent 14 years
U.S. Cl. D9—435

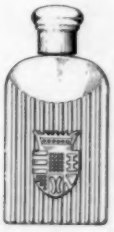
309,565
GROCERY BAG WITH HANDGRIPS
Herman Newman, and Pearl Newman, both of 123-60 83rd Ave., Kew Gardens, N.Y. 11415
Filed Jun. 2, 1987, Ser. No. 57,242
Term of patent 14 years
U.S. Cl. D9—305



309,566
COMBINED PACKAGE AND DISPENSER FOR EXTRUSIBLE COMESTIBLES
George Mileos, Riverdale, N.Y., and Robert H. Brainard, Danburry, Conn., assignors to Kraft General Foods, Inc., Glenview, Ill.
Filed Sep. 2, 1986, Ser. No. 903,059
Term of patent 14 years
U.S. Cl. D9—306

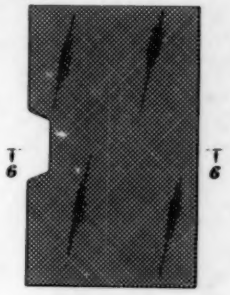
309,567
PERFUME BOTTLE WITH CLOSURE
Joel Desgrippes, Paris, France, assignor to Hanorah Italiana S.p.A., Milan, Italy
Filed Jun. 26, 1987, Ser. No. 66,649
Claims priority, application Italy, Jan. 22, 1987, 20590/87[U]
Term of patent 14 years
U.S. Cl. D9—384

309,568
PERFUME BOTTLE
Jean C. Beton, Marseilles, France, assignor to Forbees-Compagnie Generale de Participation, Marseilles, France
Filed Aug. 29, 1988, Ser. No. 237,763
Term of patent 14 years
U.S. Cl. D9—410

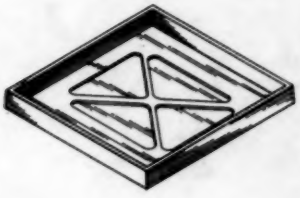


309,569
PACKAGE
Victor J. Grazi, 220 Elberon Blvd., Oakhurst, N.J. 07755
Filed Jun. 11, 1986, Ser. No. 873,315
Term of patent 14 years
U.S. Cl. D9—415

309,570
CASE FOR A VIDEO TAPE CASSETTE
Masayuki Kinoshita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 22, 1985, Ser. No. 714,894
Claims priority, application Japan, Sep. 26, 1984, 59-39918
Term of patent 14 years
U.S. Cl. D9—418



309,571
OVERFLOW WATER CONTAINMENT PEDESTAL OR SIMILAR ARTICLE
William L. Lehman, P.O. Box 427, Guilderland, N.N.Y. 12084
Filed Oct. 28, 1987, Ser. No. 114,148
Term of patent 14 years
U.S. Cl. D9—455



309,572
TRAVEL ALARM CLOCK
Motoyuki Suzuki, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jul. 6, 1987, Ser. No. 69,625
Claims priority, application Japan, Jan. 5, 1987, 62-26
Term of patent 14 years
U.S. Cl. D10—18

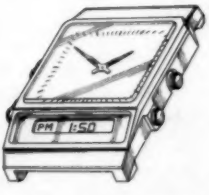
309,573
TRAVEL ALARM CLOCK
Kimio Hiruta, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jul. 6, 1987, Ser. No. 69,628
Claims priority, application Japan, Jan. 5, 1987, 62-27
Term of patent 14 years
U.S. Cl. D10—18

309,574
TRAVEL ALARM CLOCK
Keiko Mayuzumi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jul. 22, 1987, Ser. No. 76,555
Claims priority, application Japan, Jan. 23, 1987, 62-2254
Term of patent 14 years
U.S. Cl. D10—18

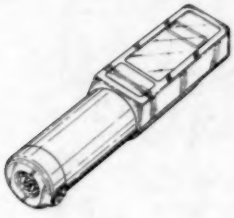
309,575
CLOCK
Keiko Nomura, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Oct. 1, 1986, Ser. No. 914,603
Claims priority, application Japan, Apr. 1, 1986, 61-11862
Term of patent 14 years
U.S. Cl. D10—24

309,576
WRISTWATCH
Hans Saurer, Viganello, Lugano, Switzerland, assignor to Christian Dior S.A., Paris, France
Filed May 14, 1987, Ser. No. 50,210
Term of patent 14 years
U.S. Cl. D10—39

309,577
WRIST WATCH
Takashi Takeichi, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jun. 11, 1987, Ser. No. 62,193
Term of patent 14 years
U.S. Cl. D10—39



309,578
ELECTRONIC THERMOMETER OR SIMILAR ARTICLE
Bernhard Schwan, Werbach, Fed. Rep. of Germany, assignor to Testoterm Fritzsching GmbH & Co., Lenzkirch, Fed. Rep. of Germany
Filed Jul. 25, 1988, Ser. No. 224,489
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1988, DM/010788
Term of patent 14 years
U.S. Cl. D10—52



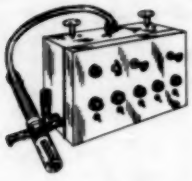
309,579
THERMOMETER
Gregory L. Cross, Arvada, Colo., assignor to Sun Company, Inc., Arvada, Colo.
Filed Feb. 26, 1987, Ser. No. 19,021
Term of patent 14 years
U.S. Cl. D10—58

309,580
COMPASS
Sanae Aoki, and Tsunataka Konoike, both of Tokyo, Japan, assignors to Tanaka Manufacturing Company Limited, Tokyo, Japan
Filed Aug. 21, 1987, Ser. No. 88,105
Term of patent 14 years
U.S. Cl. D10—68

309,581
ELECTRONIC CIRCUIT BREAKER PROGRAMMER TESTER
Thomas D. Burton, Unionville, Conn., assignor to General Electric Company, New York, N.Y.
Filed Jul. 30, 1987, Ser. No. 79,601
Term of patent 14 years
U.S. Cl. D10—78

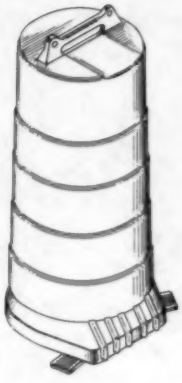
309,582
DIGITAL THERMO-HYGROMETER
Osamu Suzuki, Tokyo, Japan, assignor to 501 Tanaka Manufacturing Company Limited, Tokyo, Japan
Filed Sep. 11, 1987, Ser. No. 96,069
Term of patent 14 years
U.S. Cl. D10—53

309,583
COMBINED SYSTEM ANALYZER FOR BRAKES AND LIGHTS
Don H. Little, and David A. Little, both of 9 Granite St., Methuen, Mass. 01844
Filed Apr. 2, 1987, Ser. No. 34,053
Term of patent 14 years
U.S. Cl. D10—78



309,584
PORTABLE CONTROL HOUSING FOR GAS PURGING SYSTEM
Jagadisan Krishnamurthy, Mountain View, and Noland E. Vogt, Woodside, both of Calif., assignors to Semi-jGas Systems, Inc., San Jose, Calif.
Filed Jul. 22, 1987, Ser. No. 76,554
Term of patent 14 years
U.S. Cl. D10—81

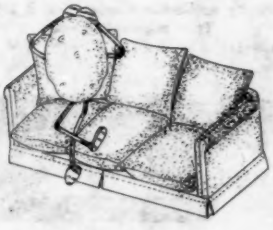
309,585
TWO PIECE BREAKAWAY TRAFFIC CHANNELIZER
Jack H. Kulp, San Juan Capistrano, Calif., assignor to Traffix Devices, Inc., San Juan Capistrano, Calif.
Filed Feb. 24, 1988, Ser. No. 159,651
Term of patent 14 years
U.S. Cl. D10—113



309,586
BRACELET
Ray S. Ruscitti, 465 W. Dominion Dr., Wood Dale, Ill. 60191
Filed Apr. 25, 1988, Ser. No. 185,822
Term of patent 14 years
U.S. Cl. D11—4

309,587
KNOCK-DOWN TOPIARY FORM
Rudy Vicenes, Cliffside Park, N.J., assignor to Spaeth Design, New York, N.Y.
Filed Mar. 26, 1987, Ser. No. 30,546
Term of patent 14 years
U.S. Cl. D11—149

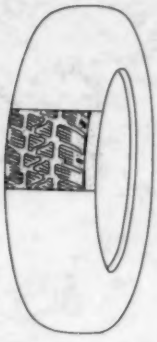
309,588
NOVELTY TABLE ORNAMENT
Sheldon J. Anderson, 7563 Benton St., Arvada, Colo. 80003, and Kevin M. Schleweis, 4920 S. Prince Ct. - #201, Littleton, Colo. 80123
Filed Apr. 1, 1987, Ser. No. 32,707
Term of patent 14 years
U.S. Cl. D11—158



309,589
FOLDING POLE STRETCHER
Glenn F. Hare, 2924 Whispering Winds Dr., Las Vegas, Nev., and Michael Boyden, 1663 Diamond St. #4, San Diego, Calif. 92109
Filed Oct. 28, 1987, Ser. No. 114,522
Term of patent 14 years
U.S. Cl. D12—128

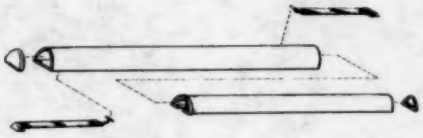
309,590
AUTOMOBILE TIRE
Akihiro Nakatani, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Nov. 24, 1987, Ser. No. 124,770
Claims priority, application Japan, May 25, 1987, 62-20543
Term of patent 14 years
U.S. Cl. D12—147

309,591
VEHICLE TIRE
Romano Guermandi, Milan, and Maurizio Boiocchi, Segrate, both of Italy, assignors to Pirelli Coordinamento Pneumatici S.p.A., Italy
Filed Oct. 20, 1987, Ser. No. 110,495
Claims priority, application Italy, May 8, 1987, 21557/87[U]
Term of patent 14 years
U.S. Cl. D12—147

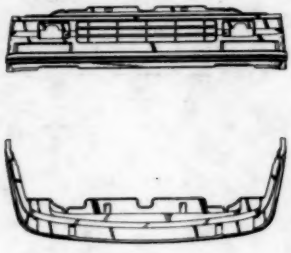


309,592
VEHICLE TIRE
Tatsuyuki Shomura, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Jul. 23, 1987, Ser. No. 77,533
Claims priority, application Japan, Feb. 12, 1987, 62-5172
Term of patent 14 years
U.S. Cl. D12—147

309,593
TELESCOPING AUTOMOBILE DOOR GUARD
Wayne E. Bailey, P.O. Box 4, Woodbridge, Va. 22194-0004
Filed Apr. 4, 1988, Ser. No. 177,032
Term of patent 14 years
U.S. Cl. D12—167

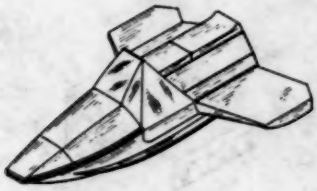


309,594
AUTOMOBILE BUMPER
Tomoyuki Arai, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1986, Ser. No. 929,763
Claims priority, application Japan, May 10, 1986, 61-17581
Term of patent 14 years
U.S. Cl. D12—169

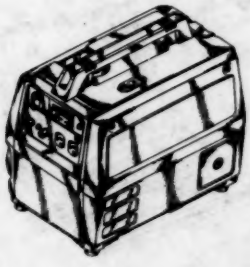


309,595
SUN VISOR WITH A POCKET FOR AN AUTOMOBILE
Mats Jönsäs, Vattnäs, Sweden, assignor to Autopart Sweden Aktiebolag, Malung, Sweden
Filed Feb. 26, 1988, Ser. No. 160,859
Claims priority, application Sweden, Sep. 2, 1987, 87-1939
Term of patent 14 years
U.S. Cl. D12—191

309,596
WATERCRAFT
William D. Castagna, 101 N. Garden Ave., Ste. 200, Clearwater, Fla. 33515
Filed May 26, 1987, Ser. No. 54,160
Term of patent 14 years
U.S. Cl. D12—300

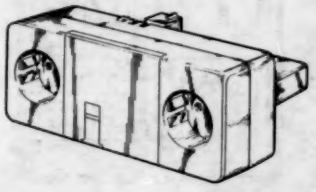


309,597
ENGINE GENERATOR
Masaaki Higuchi, Koshigaya; Masaru Atsumi, Saitama; Yasuo Otake, Ohmiya, and Yukinori Itoh, Kawagoe, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 20, 1987, Ser. No. 110,681
Claims priority, application Japan, Apr. 22, 1987, 62-015976
Term of patent 14 years
U.S. Cl. D13—116



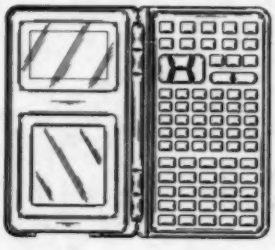
309,598
REMOTE I/O UNIT FOR A SEQUENCE CONTROLLER
Osamu Obuwa; Takichi Nagahashi; Tatsuo Ito; Hiroyoshi Ito, all of Nagoya, and Nobuyuki Kondo, Kanagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 3, 1988, Ser. No. 202,183
Claims priority, application Japan, Dec. 4, 1987, 62-49779
Term of patent 14 years
U.S. Cl. D13—162

309,599
ADAPTER FOR AN ELECTRICAL OR TELECOMMUNICATION RAIL
Harald Widell, Kalendervägen 25; Jan Widell, Augustivägen 11, and Nils-Ake Bergman, Junivägen 24, all of S-352 47 Växjö, Sweden
Filed Jun. 5, 1987, Ser. No. 58,747
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1986, 861233
Term of patent 14 years
U.S. Cl. D13—133

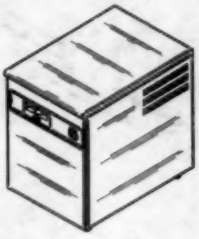


309,600
PROGRAMMABLE LOGIC CONTROLLER
James J. Backes, Hales Corners, Wis., assignor to Square D Company, Palatine, Ill.
Filed Apr. 8, 1988, Ser. No. 181,277
Term of patent 14 years
U.S. Cl. D13—162

309,601
ELECTRONIC MEMORANDUM INPUT/OUTPUT TERMINAL
Masaji Sawada, and Kuniyasu Matsumoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 24, 1988, Ser. No. 235,989
Claims priority, application Japan, Feb. 24, 1988, 63-7554
Term of patent 14 years
U.S. Cl. D14—100

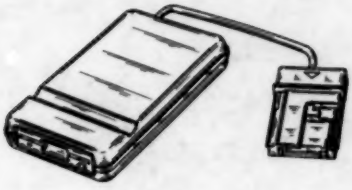


309,602
AUTOMATIC DISC CHANGER FOR ELECTRONIC FILING SYSTEM
Tooru Makidera, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 15, 1987, Ser. No. 38,828
Claims priority, application Japan, Oct. 17, 1986, 61-41435
Term of patent 14 years
U.S. Cl. D14—102

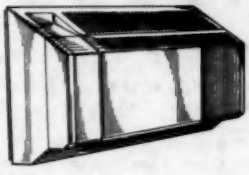


309,603
PORTABLE COMPUTER
Kanji Mizusugi; Hajime Shiozawa; Kouki Fukuda, and Yasuhiko Mano, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 28, 1989, Ser. No. 317,796
Claims priority, application Japan, Oct. 7, 1988, 63-39579
Term of patent 14 years
U.S. Cl. D14—106

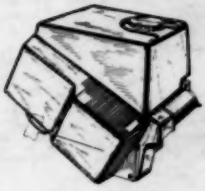
309,604
MAGNETIC DISC DRIVE WITH COUPLING MEMBER FOR A WORD PROCESSOR
Kazumi Osaka; Shinsaku Hino, and Tatsumi Wada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 10, 1988, Ser. No. 269,981
Claims priority, application Japan, May 13, 1988, 63-19040
Term of patent 14 years
U.S. Cl. D14—109



309,605
CONTROLLER HOUSING WITH EXTENDER
Duane D. Fortune, Noblesville, Ind.; Richard M. Joffe, Palisades Park, N.J.; Henry J. Mack, Jr., Levittown; John N. McGarvey, Drexel Hill, both of Pa., and Michael P. Zambelli, Maplewood, N.J., assignors to AT&T Company, Murray Hill, N.J.
Filed Apr. 6, 1987, Ser. No. 34,184
Term of patent 14 years
U.S. Cl. D14—140

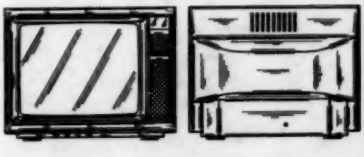


309,606
ENGINE
Gordon D. Kelly, Elm Grove, Wis., and Ronald J. Hoffman, Phoenix, Ariz., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 222,683, Jul. 21, 1988. This application Oct. 12, 1989, Ser. No. 420,234
Term of patent 14 years
U.S. Cl. D15—1



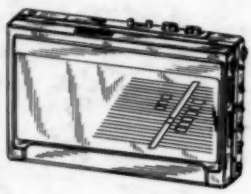
309,607
ADJUSTABLE COPY HOLDER FOR COMPUTERS
Bradley M. Nemeth, San Francisco, Calif., assignor to Wendell R. Brooks, Inc., Ft. Worth, Tex.
Filed Jul. 24, 1989, Ser. No. 384,455
Term of patent 14 years
U.S. Cl. D14—114

309,608
TELEVISION SET
Takeo Hashiba, and Harumi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,729
Claims priority, application Japan, May 26, 1987, 62-21002
Term of patent 14 years
U.S. Cl. D14—126

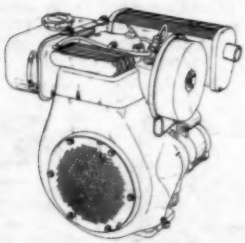


309,609
TELEVISION SET
Harumi Sakamoto, and Tomitaro Saito, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 121,744
Claims priority, application Japan, May 21, 1987, 62-20204
Term of patent 14 years
U.S. Cl. D14—126

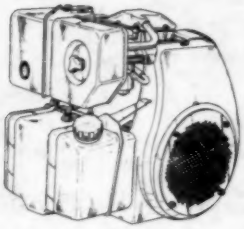
309,610
COMBINED TAPE PLAYER, TELEVISION SOUND AND RADIO TUNER
Norio Hosaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 10, 1987, Ser. No. 119,411
Claims priority, application Japan, May 13, 1987, 62-18701
Term of patent 14 years
U.S. Cl. D14—163



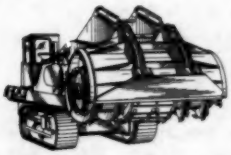
309,611
INTERNAL COMBUSTION ENGINE
Kiichiro Yamada, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan
Filed Sep. 13, 1988, Ser. No. 244,044
Claims priority, application Japan, Mar. 7, 1988, 63-9339
Term of patent 14 years
U.S. Cl. D15—1



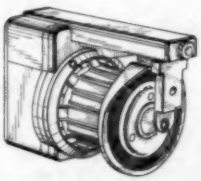
309,612
INTERNAL COMBUSTION ENGINE
Teruo Nakagawa, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan
Filed Oct. 20, 1988, Ser. No. 261,026
Claims priority, application Japan, Jul. 5, 1988, 63-26987
Term of patent 14 years
U.S. Cl. D15—1



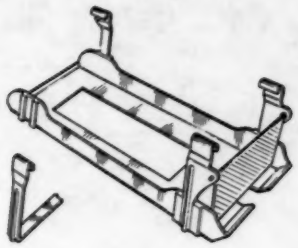
309,613
ROAD PLANER
Jerry F. Gilbert, 3545 E. Main St., Grand Prairie, Tex. 75050
Filed Apr. 17, 1987, Ser. No. 39,664
Term of patent 14 years
U.S. Cl. D15—23



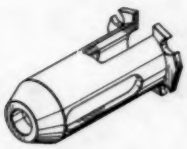
309,614
YARN FEEDER FOR TEXTILE MACHINES
Bruno Maina, Valdengo, Italy, assignor to ROJ Electrotex S.p.A., Biella, Italy
Filed Apr. 12, 1988, Ser. No. 180,829
Claims priority, application Italy, Oct. 12, 1987, 22525/87[U]
Term of patent 14 years
U.S. Cl. D15—78



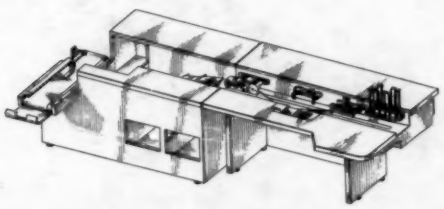
309,615
BEVERAGE CAN HOLDER FOR A REFRIGERATOR
Ray E. Arnatt, 3412 Conrad Ave., San Diego, Calif. 92117
Filed Apr. 6, 1987, Ser. No. 34,588
Term of patent 14 years
U.S. Cl. D15—89



309,616
NOSE PIECE FOR A PECK DRILL
Joseph F. Carter; John F. Stewart, and James A. Maass, all of Lexington, S.C., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Oct. 30, 1987, Ser. No. 116,124
Term of patent 14 years
U.S. Cl. D15—138



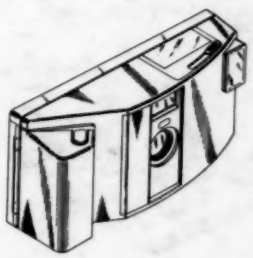
309,617
MACHINE FOR INSERTING PAPER SHEETS INTO ENVELOPES
Charles E. Bain, West Dundee, Ill., assignor to Bell & Howell Company, Skokie, Ill.
Filed Apr. 6, 1987, Ser. No. 34,587
Term of patent 14 years
U.S. Cl. D15—199



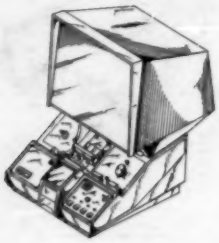
309,618
EYEGLASSES
Tony Evans, 5672 Fawn Dr., Powder Springs, Ga. 30073
Filed Jan. 4, 1988, Ser. No. 140,596
Term of patent 14 years
U.S. Cl. D16—102

309,619
RETAINER FOR EYEGLASSES
Edward V. L. Kalbach, 561 N. Main, Logan, Utah 84321
Filed Sep. 11, 1987, Ser. No. 95,878
Term of patent 14 years
U.S. Cl. D16—129

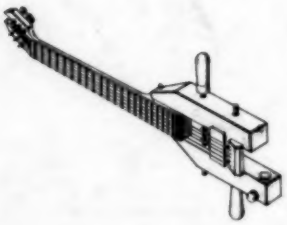
309,620
STILL CAMERA
Barry Wingate, San Jose, and Hartmut H. Esslinger, Los Gatos, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 2, 1987, Ser. No. 56,841
Term of patent 14 years
U.S. Cl. D16—209



309,621
MICROFILM READER
Peretz Chaikin, Habika, Israel, assignor to Microvue Products, Habika, Israel
Filed Jul. 30, 1986, Ser. No. 890,525
Term of patent 14 years
U.S. Cl. D16—225

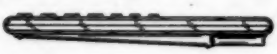


309,622
GUITAR
Keith Strasser, 15 Sandalwood Dr., Smithtown, N.Y. 11787
Filed Mar. 23, 1987, Ser. No. 29,469
Term of patent 14 years
U.S. Cl. D17—18

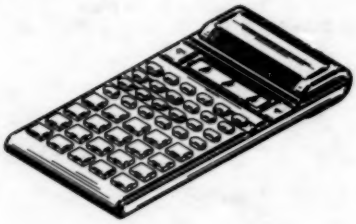


309,623
ELECTRONIC CALCULATOR
Masaji Sawada; Katsuhiro Iida, and Toshiya Takahashi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 9, 1987, Ser. No. 130,730
Claims priority, application Japan, Jun. 22, 1987, 62-25580
The portion of the term of this patent subsequent to Jun. 12, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7

309,624
ELECTRONIC CALCULATOR
Takahisa Yubisui; Hiroshi Sakaguchi, and Mieko Harada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 10, 1986, Ser. No. 918,866
Claims priority, application Japan, Apr. 11, 1986, 61-13463
The portion of the term of this patent subsequent to May 1, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7

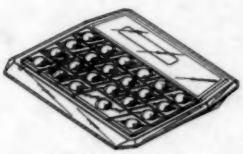


309,625
ELECTRONIC CALCULATOR
Masaji Sawada, and Toshiya Takahashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 16, 1987, Ser. No. 109,845
Claims priority, application Japan, Apr. 27, 1987, 62-16716
Term of patent 14 years
U.S. Cl. D18—7

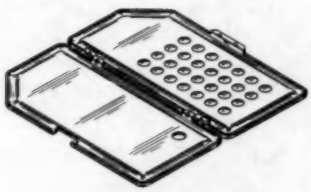


309,626
ELECTRONIC CALCULATOR
Hiroshi Sakaguchi, and Keiichi Koyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 30, 1987, Ser. No. 139,694
Claims priority, application Japan, Jul. 9, 1987, 62-28347
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—7

309,627
CALCULATOR
William H. K. Chu, No. 106, Wan-Shun Liau, Shen-Keng Hsiang, Taipei Hsien, Taiwan 22202
Filed Jan. 8, 1987, Ser. No. 1,984
Term of patent 14 years
U.S. Cl. D18—7

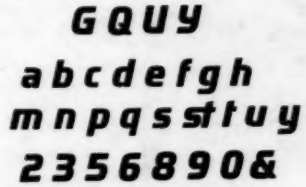


309,628
CASE FOR ELECTRONIC CALCULATOR
Masaji Sawada; Hiroshi Sakaguchi, and Katsuhiro Iida, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 7, 1987, Ser. No. 70,538
Claims priority, application Japan, Jan. 7, 1987, 62-191
Term of patent 14 years
U.S. Cl. D18—11



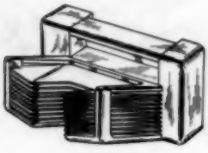
309,629
CALCULATOR CASE
Joseph C. Sereika, Stanhope; Terry L. Barner, Morris Plains, and Thomas Perelli, Stanhope, all of N.J., assignors to Monroe Systems For Business, Inc.
Filed Oct. 13, 1987, Ser. No. 110,471
Term of patent 14 years
U.S. Cl. D18—11

309,630
FONT OF TYPE OR THE LIKE
Richard Foy; Thomas Ruzicka; David A. Shelton, and David M. Tweed, all of Boulder, Colo., assignors to U.S. West Inc., Englewood, Colo.
Filed Feb. 25, 1988, Ser. No. 160,082
Term of patent 14 years
U.S. Cl. D18—24



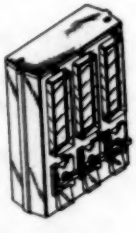
309,631
SORTER
Akiyoshi Tanizawa, and Masahiro Murakami, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Nov. 30, 1987, Ser. No. 127,003
Claims priority, application Japan, May 30, 1987, 62-22308[U]
Term of patent 14 years
U.S. Cl. D18—42

309,632
SORTER FOR COPIER
Takeshi Komada, Yokohama; Minoru Aoyama, Tokyo; Tomohiko Hirata, Kawasaki, and Mitsuru Sakurai, Musashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 12, 1988, Ser. No. 180,800
Claims priority, application Japan, Oct. 15, 1987, 62-42293
Term of patent 14 years
U.S. Cl. D18—42



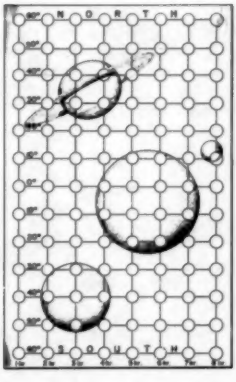
309,633
BALL-POINT PEN OR SIMILAR ARTICLE
Kunio Itoh, Funabashi, Japan, assignor to Pentel Kabushiki Kaisha, Japan
Filed Feb. 18, 1987, Ser. No. 15,873
Term of patent 14 years
U.S. Cl. D19—51

309,634
VENDING MACHINE
Alvin R. McDaniel; Edgar B. Wood; Lyle D. Hanh, and Ted L. Milton, all of Idaho Falls, Id., assignors to Innovative Design & Marketing, Inc., Idaho Falls, Id.
Filed Dec. 30, 1986, Ser. No. 947,965
Term of patent 14 years
U.S. Cl. D20—7

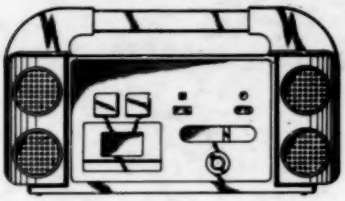


309,635
MENU SIGN
Robert P. Hilemn, Greensboro, N.C., assignor to Sterling Products, d./b./a. Sterling Signal Greensboro, N.C.
Filed Nov. 19, 1987, Ser. No. 123,163
Term of patent 14 years
U.S. Cl. D20—42

309,636
GAMEBOARD
Thomas D. Bailey, 411 Berkshire Dr., Tallahassee, Fla. 32304
Filed Oct. 19, 1987, Ser. No. 86,294
Term of patent 14 years
U.S. Cl. D21—31



309,637
SOUNDING TOY
Takashi Maezono, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Apr. 4, 1988, Ser. No. 177,157
Claims priority, application Japan, Oct. 8, 1987, 62-41217
Term of patent 14 years
U.S. Cl. D21—64

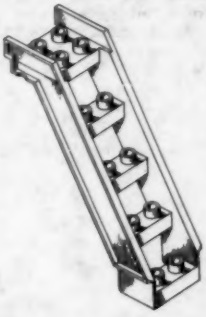


309,638
TOY BUILDING BLOCK
Anton Meyer, Gratzerstrasse 3, D-8000 Ingolstadt 2, Fed. Rep. of Germany
Filed Feb. 3, 1988, Ser. No. 151,804
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, P10-17335
Term of patent 14 years
U.S. Cl. D21—108

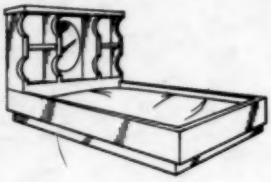
309,639
TOY PALM TREE
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1988, Ser. No. 277,913
Term of patent 14 years
U.S. Cl. D21—108

309,640
TOY PALM LEAF CONSTRUCTION ELEMENT
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1988, Ser. No. 277,915
Term of patent 14 years
U.S. Cl. D21—108

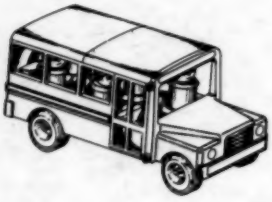
309,641
TOY STAIRCASE
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1988, Ser. No. 277,905
Term of patent 14 years
U.S. Cl. D21—109



309,642
TOY WATER BED
Harry R. MacVeigh, Box 208, Berlin, N.Y. 12022
Filed Apr. 30, 1987, Ser. No. 44,132
Term of patent 14 years
U.S. Cl. D21—123

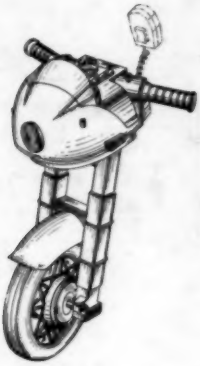


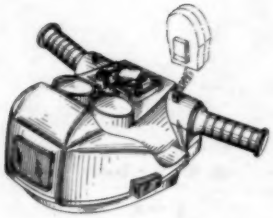
309,643
COMBINED TOY BUS AND FIGURINES
Augusto A. Picozza, Johnston; Lawrence O. Freese, Providence, both of R.I., and Rino Conti, Stoughton, Mass., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jul. 31, 1987, Ser. No. 80,374
Term of patent 14 years
U.S. Cl. D21—128



309,644
FISHING LINE RETRIEVER
Jonathan B. Orlick, 100 S. Highland Ave., #F, Placentia, Calif. 92670, and William H. Howard, Irvine, Calif., assignors to Jonathan B. Orlick, Fort Worth, Tex.
Filed Apr. 18, 1988, Ser. No. 182,568
Term of patent 14 years
U.S. Cl. D22—134

309,645
TOY MOTORCYCLE
Ho T. Kuen, Wan Chai, Hong Kong, assignor to Ever Sparkle Industrial Co. Lts., Kwai Chung, Hong Kong
Filed Dec. 19, 1989, Ser. No. 452,948
Term of patent 14 years
U.S. Cl. D21—142





309,646
TOY ROAD BOARD
Linda D. Halbert, 1567 Hooker Oak Ave., Chico, Calif. 95926
Filed Jul. 27, 1987, Ser. No. 78,927
Term of patent 14 years
U.S. Cl. D21—143

309,647

ANIMAL TOY FIGURE

Yoshihiro Sekiguchi, Ichikawa, Japan, assignor to Kabushiki Kaisha Sun Arrow, a Japanese Corporation, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 108,882

Claims priority, application Japan, Apr. 10, 1987, 62-014067

Term of patent 14 years

U.S. Cl. D21—156

309,648

NOVELTY WITCH STICK

William Baron, New York, N.Y., and Neall Humphrey, Dorado Hills, Calif., assignors to Trade Source International, Dorado Hills, Calif.

Filed Feb. 10, 1987, Ser. No. 12,934

Term of patent 14 years

U.S. Cl. D21—190

309,649

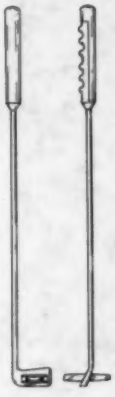
GOLF SWING GUIDE CLUB

Howard E. Archer, 1775 NE. 2nd Ave., Apt.#5, Miami, Fla. 33132

Filed Nov. 19, 1986, Ser. No. 932,383

Term of patent 14 years

U.S. Cl. D21—214



309,650

FISHING REEL BODY

Yasuhisa Kameda, and Toshiaki Yoshikawa, both of Musashino, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

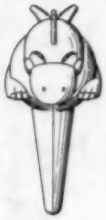
Filed May 2, 1988, Ser. No. 189,606

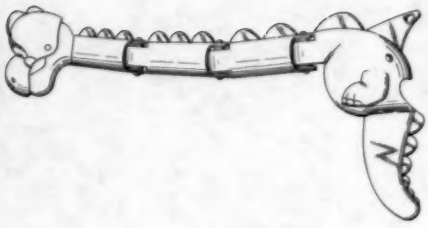
Claims priority, application Japan, Nov. 9, 1987, 62-45709

Term of patent 14 years

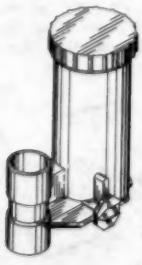
U.S. Cl. D22—141

309,651
OBJECT SNATCHING GAME DEVICE
Mitsunori Noshiro, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Mar. 14, 1988, Ser. No. 167,413
Claims priority, application Japan, Sep. 28, 1987, 62-39553
Term of patent 14 years
U.S. Cl. D21—206

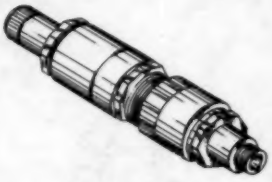




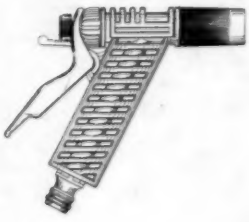
309,652
DISPENSER FOR LAWN CARE CHEMICALS OR THE LIKE
Philip E. Chalberg, Costa Mesa, and Katsumi Kawato, Woodland Hills, both of Calif., assignors to Martech Enterprises, Inc., Santa Ana, Calif.
Filed Aug. 27, 1986, Ser. No. 901,179
Term of patent 14 years
U.S. Cl. D23—207



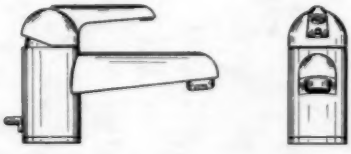
309,653
CHEMICAL DISPENSER
Virgil P. Kendrick, 10822 E. Revels Rd., Howey-in-the-Hills, Fla. 32737
Filed Oct. 27, 1987, Ser. No. 113,267
Term of patent 14 years
U.S. Cl. D23—213



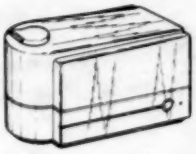
309,654
SPRAY GUN
Gianfranco Roman, Paziano, Italy, assignor to Claber S.p.A., Italy
Filed Oct. 2, 1987, Ser. No. 104,672
Claims priority, application Italy, Apr. 6, 1987, 21331/87[U]
Term of patent 14 years
U.S. Cl. D23—226



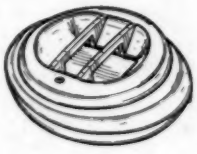
309,655
FAUCET
Herbert Reinecke, Iserlohn, Fed. Rep. of Germany, assignor to Aloys F. Dornbracht GmbH & Co., Iserlohn, Fed. Rep. of Germany
Division of Ser. No. 905,235, Sep. 8, 1986. This application Jun. 29, 1989, Ser. No. 373,777
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, MR7474; Aug. 25, 1986, MR7498
Term of patent 14 years
U.S. Cl. D23—238



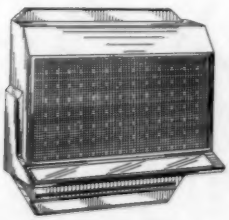
309,656
HUMIDIFIER
Jae W. Lee, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,364
Claims priority, application Rep. of Korea, Jun. 11, 1987, 8784/1987
Term of patent 14 years
U.S. Cl. D23—356



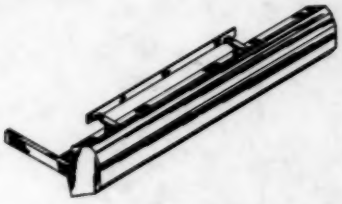
309,657
ELECTRONIC FUMIGATOR
Jong C. Park, Seoul, Rep. of Korea, assignor to Lucky, Ltd., Seoul, Rep. of Korea
Filed Jun. 10, 1987, Ser. No. 60,362
Claims priority, application Rep. of Korea, May 9, 1987, 87-6848
Term of patent 14 years
U.S. Cl. D23—362



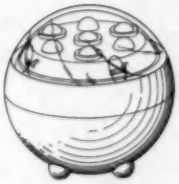
309,658
FAN HOUSING
Richard C. Schneider, 26 Dudley St., Arlington, Mass. 02174
Filed May 26, 1987, Ser. No. 54,365
Term of patent 14 years
U.S. Cl. D23—370



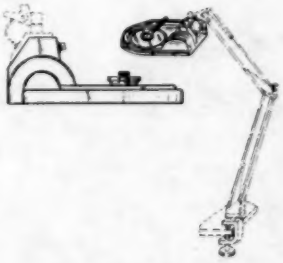
309,659
HOT AIR AND FUME DIRECTOR FOR CONVEYOR OVEN
Clarke T. Welsh, Logansport, Ind., assignor to LDI Mfg. Co., Inc., Logansport, Ind.
Filed Dec. 27, 1988, Ser. No. 289,762
Term of patent 14 years
U.S. Cl. D23—387



309,660
COMBINED MASSAGER AND COVER
Jean-Mary Saguin, 8 rue Joseph Mugnier, 73200 Albertville, France
Filed Mar. 8, 1988, Ser. No. 164,995
Claims priority, application Int'l Pat. Institute, Sep. 11, 1987, DM/009 283
Term of patent 14 years
U.S. Cl. D24—36

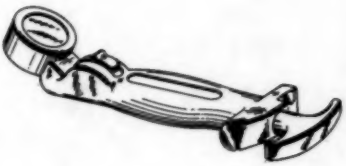


309,661
COMBINED LAMP AND MAGNIFIER
Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.
Filed Feb. 2, 1987, Ser. No. 10,147
Term of patent 14 years
U.S. Cl. D26—51

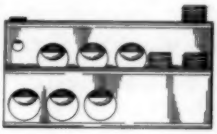


309,662
MEDICATION INFUSION PUMP
Lanny A. Gorton, Sunland, Calif., assignor to Pacesetter Infustion, Ltd., Sylmar, Calif.
Filed Dec. 1, 1987, Ser. No. 128,533
Term of patent 14 years
U.S. Cl. D24—51

309,663
BALLOON CATHETER INFLATOR
David B. Robinson, Chanhassen, Minn., assignor to SciMed Life Systems, Inc., Minneapolis, Minn.
Filed Dec. 14, 1987, Ser. No. 132,861
Term of patent 14 years
U.S. Cl. D24—54



309,664
SET SCREW TRANSFORMER CONNECTOR
Eugene W. McGraw, Ormond Beach, Fla., assignor to Homac Mfg. Company, Ormond Beach, Fla.
Filed Jun. 10, 1988, Ser. No. 206,164
Term of patent 14 years
U.S. Cl. D13—146



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Snygg, Keijo K., 4,944,467, Cl. 242-65.000.

A. E. Staley Manufacturing Company: *See*—
Hartman, Guy J.; and Spyres, Gary G., 4,944,953, Cl. 426-271.000.

A K Stamping Co., Inc.: *See*—
Leonardo, Ignazio E., 4,944,683, Cl. 439-96.000.

A.R.D. Industries Ltd.: *See*—
Shantz, Ronald B.; and Knight, Robert J., 4,944,977, Cl. 428-36.920.

A. T. Avanzata Tecnologia S.R.L.: *See*—
Gagliano, Vitaliano, 4,944,047, Cl. 4-312.000.

A-Z Formen- und Maschinenbau GmbH: *See*—
Hilke, Rainer; and Schmaderer, Gerhard, 4,944,666, Cl. 425-131.100.

AB Akerlund & Rausing: *See*—
Piltz, Lars-Erik, 4,944,426, Cl. 220-270.000.

AB Tetra Pak: *See*—
Carlsson, Lars C.; Stark, Sven O. S.; and Bengtsson, Ulf, 4,944,132, Cl. 53-167.000.

ABB Power T&D Company: *See*—
Adkins, Herbert S.; and Harris, Darrell D., 4,944,420, Cl. 220-3.300.

ABB Stal AB: *See*—
Hjalmarsson, Lennart, 4,944,148, Cl. 60-39.020.
Ostman, Sven-Olov, 4,944,150, Cl. 60-39.182.

Abbott Laboratories: *See*—
Pastrone, John; Fellingham, George H.; and Lawless, Michael, 4,944,191, Cl. 73-599.000.

Abby Brooks Corporation: *See*—
Wall, Carole, 4,944,059, Cl. 5-431.000.

Abe, Ichiro; and Suzuki, Toshio, to Kirin Beer Kabushiki Kaisha. Label peeler. 4,944,832, Cl. 156-584.000.

Abe, Minoru: *See*—
Nakamura, Kunio; and Abe, Minoru, 4,944,079, Cl. 29-33.00M.

Abe, Nobumasa: *See*—
Yamagata, Kiyohiro; Abe, Nobumasa; Toba, Koichi; Kobayashi, Atsushi; and Watanabe, Koji, 4,945,381, Cl. 355-27.000.

Abe, Susumu: *See*—
Matsushita, Akira; and Abe, Susumu, 4,944,270, Cl. 123-414.000.

Abe, Yoshio: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.

Abolins, Visvaldis; Betts, Joseph E.; Holub, Fred F.; and Lee, Gim F., Jr., to General Electric Company. Crosslinkable flame retardant composition of polyolefin and polyphenylene ether. 4,945,018, Cl. 524-141.000.

Abrevaya, Hayim, to UOP. Fischer-Tropsch synthesis process employing a moderated ruthenium catalyst. 4,945,116, Cl. 518-715.000.

Abstetar, Michael J.; and Koppitz, Richard W. Truck bed liner. 4,944,612, Cl. 296-39.200.

Acer Incorporated: *See*—
Hwang, Chiang-Tung; and Chou, Ray-Shun, 4,945,303, Cl. 324-78.00D.
Lee, Kun-Ming; and Hwang, Ching-Dong, 4,945,264, Cl. 307-475.000.

ACF Industries, Incorporated: *See*—
Dugge, Richard H.; and Coulborn, John W., 4,944,233, Cl. 105-377.000.

Achenbach, Kurt F., to Ford Motor Company. Telescoping strut suspension with friction reducing torsional unloading device. 4,944,524, Cl. 280-701.000.

Ackerson, Bruce D.; Paker, Stephen J.; and Wahlquist, Clayton C., to Unisys Corp. Dynamic vertical height control circuit. 4,945,292, Cl. 315-387.000.

Actel Corporation: *See*—
Galbraith, Douglas C., 4,945,267, Cl. 307-571.000.

Acustar, Inc.: *See*—
Peveto, Johnnie E., 4,944,629, Cl. 403-330.000.

Adachi, Yasuo: *See*—
Shiromoto, Keigo; Adachi, Yasuo; and Nabae, Kiyoyuki, 4,944,932, Cl. 423-447.600.

Adam, John D., to Westinghouse Electric Corp. Monolithic frequency selective limiter fabrication. 4,944,857, Cl. 204-192.150.

Adams, Horst H.; Bruggestrath, Bernd; and Kappe, Rudolf A., to Gebruder Adams Armaturen U. Apparate GmbH & Co., K.G. Rotary valve and seal. 4,944,489, Cl. 251-306.000.

Addmaster Corporation: *See*—
Scozzafava, Milton; and Clary, John G., 4,944,620, Cl. 400-608.100.

Adeka Argus Chemical Co., Ltd.: *See*—
Akutsu, Mitsuo; Iwakura, Syuji; and Oya, Keiji, 4,944,980, Cl. 428-64.000.

Adkins, Herbert S.; and Harris, Darrell D., to ABB Power T&D Company. Oil-filled transformer housing. 4,944,420, Cl. 220-3.300.

Advance Systems, Inc.: *See*—
Hella, Terry A.; and Perry, Gary L., 4,944,098, Cl. 34-156.000.

Advanced Micro Devices, Inc.: *See*—
Naghshineh, Kanoosh; and Campbell, David L., 4,945,260, Cl. 307-296.600.

AFC, Inc.: *See*—
Fingerson, Conrad F.; Nelson, Bruce A.; Carlson, Dennis L.; and Eickhoff, Robert D., 4,944,520, Cl. 273-419.000.

Agelatos, Dionisios; and Agelatos, Sortirios. Condition-specific toilet ventilation system. 4,944,045, Cl. 4-213.000.

Agelatos, Sortirios: *See*—
Agelatos, Dionisios; and Agelatos, Sortirios, 4,944,045, Cl. 4-213.000.

Agency of Industrial Science and Technology: *See*—
Michizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, 4,944,881, Cl. 210-640.000.

Aguiar, Ocasio F.; Rodriguez, Facundo T.; and Fuentes, Raul. Grill apparatus. 4,944,282, Cl. 126-25.00R.

Ahlstromforetagen Svenska AB: *See*—
Henricson, Kaj; Ryham, Rolf; and Sannholm, Krister, 4,944,840, Cl. 162-46.000.

Aigner, Robert K.: *See*—
Mahon, Joseph J.; and Aigner, Robert K., 4,945,196, Cl. 200-38.00C.

Aigrain, Pierre; Mourey, Bruno; Dubois, Jean C.; Hareng, Michel; and Robin, Philippe, to Thomson-CSF. Electrooptical display screen and a method of fabrication of said screen. 4,944,575, Cl. 350-333.000.

Aikawa, Takeshi: *See*—
Maeda, Ken-ichi; Saito, Mitsuo; Aikawa, Takeshi; Matoba, Tsukasa; and Okamura, Mitsuyoshi, 4,945,510, Cl. 364-900.000.

Air Muscle Limited: *See*—
Hennequin, James R.; and Fluck, Peter, 4,944,755, Cl. 623-19.000.

Air Products and Chemicals, Inc.: *See*—
Dunbobbin, Brian R.; Carlin, Richard T.; and Cassano, Anthony A., 4,944,934, Cl. 423-579.000.

Airey, Peter, to Schlumberger Technology Corporation. Tool for closing a well tubing. 4,944,350, Cl. 166-373.000.

Airrigation Engineering Co., Inc.: *See*—
Waite, Diana H.; Chance, Nathan H., Jr.; and Edmiston, Robert A., 4,944,320, Cl. 134-167.00C.

Aisan kogyo Corporation: *See*—
Suzuki, Yasuhiro; Yoshikawa, Tuguo; Shibata, Kazuhiro; Fukui, Akio; and Shiga, Kiyotaka, 4,944,640, Cl. 408-211.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Harada, Kouhei; and Hasegawa, Hiromi, 4,944,193, Cl. 74-15.860.
Masumoto, Tsuyoshi; Inoue, Akihisa; Matsuzaki, Kunio; Ishii, Masami; Yabuno, Ryohei; and Oka, Tetsuo, 4,944,183, Cl. 73-295.000.
Nakashima, Hiroshi, 4,945,298, Cl. 318-635.000.
Nonaka, Shiro; Hagino, Seiichiro; and Ando, Tsukasa, 4,944,237, Cl. 112-315.000.

Aisin-Warner Kabushiki Kaisha: *See*—
Ozaki, Kazuhisa; and Miura, Masakatsu, 4,944,376, Cl. 192-17.00A.

Aisin-Warner Limited: *See*—
Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,945,482, Cl. 364-424.100.

Aiuola, Franco; and Piccinini, Renato, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Apparatus for grouping bags dispensed by an automatic device. 4,944,138, Cl. 53-540.000.

Akamatsu, Kooji: *See*—
Tanaka, Toshiaki; Nishikawa, Morihisa; Ozaki, Yoshio; Akamatsu, Kooji; Nakata, Masahiro; and Taneda, Atsushi, 4,945,199, Cl. 219-69.130.

Akao, Michitoshi: *See*—
Sakai, Toshio; and Akao, Michitoshi, 4,945,222, Cl. 250-205.000.

Akazawa, Michihiro: *See*—
Kurauchi, Yasuhiro; Akazawa, Michihiro; Harada, Tsuneo; Oyama, Kiyotaka; and Tokuda, Akira, 4,944,852, Cl. 204-131.000.

Akiike, Shigeru; and Rikukawa, Yuuji, to Sanden Corporation. Method of defrosting a refrigerating circuit for use in cooling a vehicular chamber. 4,944,158, Cl. 62-81.000.

Akizuki, Kunio, to Ichikoh Industries Ltd. Automotive projector-type headlamp. 4,945,455, Cl. 362-61.000.

Aktiebolaget Electrolux: *See*—
Andreasson, Bo C., 4,944,897, Cl. 261-35.000.
Carlsson, Bo P. I.; and Svensson, Ulf M., 4,944,272, Cl. 123-438.000.
Svanberg, Joakim A.; Kilstrom, Lars G.; Tuvin, Lars G.; and Larsson, Anders E. C., 4,944,065, Cl. 15-327.00C.

Akutsu, Mitsuo; Iwakura, Syuji; and Oya, Keiji, to Adeka Argus Chemical Co., Ltd. Optical recording material. 4,944,980, Cl. 428-64.000.

Akzo America Inc.: *See*—
Piotrowski, Andrzej M.; and Band, Elliot I., 4,945,076, Cl. 502-117.000.

Akzo N. V.: *See*—
Turner, James E.; Thorpe, Thurman C.; Di Guiseppi, James L.; and Driscoll, Richard C., 4,945,060, Cl. 435-291.000.

Alberta Ltd.: *See*—
Clayson, Peter D., 4,944,488, Cl. 251-203.000.

Albright, Henry J., to Fawn Engineering Corp. Shelf assembly for vending tubular products. 4,944,414, Cl. 211-59.200.

Alcatel NA, Inc.: *See*—
Oglesby, Michael L.; and Cornelison, Kenneth E., 4,944,570, Cl. 350-96.230.

Alcon Laboratories, Inc.: *See*—
Clark, Abbot F., 4,945,089, Cl. 514-171.000.

Aleckner, John F., Jr.; Cherry, David J.; and Spencer, Lee R., Jr., to Dexter Corporation. Thermoplastic compositions and articles made therefrom. 4,945,005, Cl. 428-500.000.

Alerting Communicators of America: *See*—
Biersach, James E., 4,945,334, Cl. 340-388.000.

Alexander, David K., to Kadel Engineering Corporation. Vacuum separator for dewar flask cold exchange systems. 4,944,155, Cl. 62-45.100.

Alexander, Guy B.; and Nadkarni, Ravindra M., to Leach & Garner. Method for electroless plating of ultrafine or colloidal particles and products produced thereby. 4,944,985, Cl. 428-570.000.

Alexander, William; and Bertane, Mark, to American Colloid Company. Anti-friction composition containing MgO and method. 4,944,634, Cl. 405-184.000.

Alexandre, Raymond J., to Alexandre, Raymond Joseph; and Masel, Richard P. Intraosseus dental anesthesia apparatus and method. 4,944,677, Cl. 433-165.000.

Alexandre, Raymond Joseph: *See*—
Alexandre, Raymond J., 4,944,677, Cl. 433-165.000.

ALFA-Laval Agri Scandinavia A/S: *See*—
Madsen, Holger, 4,944,227, Cl. 104-103.000.

Alfred University: *See*—
Kohli, Jeffrey T.; and Shelby, James E., 4,944,784, Cl. 65-32.300.

Allegheny Ludlum Corporation: *See*—
Johns, Robert H.; and Rzomp, J. Richard, 4,944,495, Cl. 266-100.000.

Allen-Bradley Company, Inc.: *See*—
Bremenour, Edwin L.; Tratar, Michael F.; and Pepera, Gerald S., 4,945,448, Cl. 361-383.000.

Allen, John H.; and Reif, Robert S., to United States of America, Navy. Generic radar display. 4,944,679, Cl. 434-2.000.

Allen, Lisa P.; Vu, Duy-Phach; Batty, Michael W.; Morrision, Richard H., Jr.; and Zavracky, Paul M., to Kopin Corporation. Seeding process in zone recrystallization. 4,944,835, Cl. 156-620.700.

Allen, Nelson K.: *See*—
Sanford, John C.; Wolf, Edward D.; and Allen, Nelson K., 4,945,050, Cl. 435-172.100.

Allen, Truman F.: *See*—
Robertson, G. Neil, II; and Allen, Truman F., 4,944,291, Cl. 128-203.110.

Allied-Signal Inc.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; Good, Stanley B.; and Hendrix, Troy C., 4,944,527, Cl. 280-741.000.
Chambers, Warren D.; and Jurczak, Jeffrey T., 4,944,370, Cl. 188-71.500.
Eberling, Charles E., 4,944,526, Cl. 280-704.000.
Joco, Fidel M., 4,944,660, Cl. 417-407.000.
Krause, William E.; and Sanford, Norman R., 4,945,550, Cl. 375-94.000.
Kuper, Jerry W.; Barrett, Joseph J.; Langert, William E.; Baker, Martin C.; and Stephenson, Andrew N., 4,944,567, Cl. 350-96.180.
Mason, Charles D.; Young, John A.; Haylock, John C.; and Twilley, Ian C., 4,945,129, Cl. 525-66.000.
Tackett, Wendell D., 4,944,331, Cl. 137-625.650.
Taig, Alistair G., 4,944,372, Cl. 188-156.000.

Allina, Edward F. Electrical plug-in connectors. 4,944,692, Cl. 439-517.000.

Allison, Joseph L.: *See*—
Pennington, Donald W.; and Allison, Joseph L., 4,945,133, Cl. 525-261.000.

Allred, Cecil F. Concrete wall form apparatus. 4,944,664, Cl. 425-63.000.

Aloka Co., Ltd.: *See*—
Nakajima, Masato; and Ito, Takashi, 4,944,189, Cl. 73-861.250.

Alpha Therapeutic Corporation: *See*—
Oleson, John C.; Teske, Steven K.; Iturzaeta, Richard F.; and Langer, Erwin E., 4,944,647, Cl. 414-412.000.

Alpine Electronics Inc.: *See*—
Namekawa, Makoto, 4,945,556, Cl. 379-58.000.

Aluminum Company of America: *See*—
McNish, Billy G.; and Harper, Jarvis, 4,944,247, Cl. 119-1.000.
Pedersen, Lee A.; and Stiles, Alvin B., 4,945,079, Cl. 502-314.000.

Alves, Andre. Clutch engager sleeve. 4,944,641, Cl. 408-239.00A.

Alvino, Frank J., to Healthscan, Inc. Spirometer for pulmonary measurement. 4,944,306, Cl. 128-725.000.

Amachi, Nobumitsu: *See*—
Fukuda, Takeshi; Amachi, Nobumitsu; Sakama, Mitsunori; Sakamoto, Naoya; and Yamazaki, Shunpei, 4,945,226, Cl. 250-214.00R.

American Colloid Company: *See*—
Alexander, William; and Bertane, Mark, 4,944,634, Cl. 405-184.000.

American Cyanamid: *See*—
Luxon, Bruce A.; and Murthy, Malalur V., 4,944,965, Cl. 427-389.700.

American Cyanamid Company: *See*—
DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,945,158, Cl. 536-117.000.
Kohli, Dalip K., 4,945,170, Cl. 548-522.000.
Minetti, Dawn C., 4,945,107, Cl. 514-473.000.
Spelts, Laurine M.; Walworth, Bryant L.; and Pavlista, Alexander D., 4,944,788, Cl. 71-88.000.

American Fluoroseal Corporation: *See*—
Soodak, Charles I.; and Ulrich, Robert R., 4,945,203, Cl. 219-121.640.

American National Can Company: *See*—
Blembereg, Robert J., 4,944,972, Cl. 428-35.200.

American Standard Inc.: *See*—
Balukin, Richard F.; Reiss, John R.; and Jerina, Frank J., 4,944,564, Cl. 303-33.000.

American Sterilizer Company: *See*—
Mueller, Wolfgang; and Nagare, Arthur T., 4,944,500, Cl. 269-322.000.

Ametek Corporation: *See*—
Scally, Henry A.; and Gingrich, Harold L., 4,944,190, Cl. 73-861.580.

Ammann, Arthur J., to Genentech, Inc. Methods and compositions for the treatment of lung conditions. 4,944,941, Cl. 424-85.500.

Ammermann, Eberhard: *See*—
Zipplies, Matthias; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, 4,945,112, Cl. 514-555.000.

Amoco Corporation: *See*—
Stanley, Timothy D.; and Bodine, John H., 4,945,519, Cl. 367-48.000.

Amorim, Osvaldo: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

AMP Incorporated: *See*—
Imai, Akira, 4,944,690, Cl. 439-492.000.
Lundergan, Robert G., 4,944,688, Cl. 439-275.000.
Nakamura, Kunio; and Abe, Minoru, 4,944,079, Cl. 29-33.00M.
Puerner, Dean A., 4,944,693, Cl. 439-358.000.

Amskan Limited: *See*—
Gamgee, Christopher J.; Leigh-Jones, Peter; and Jungo, Charles, 4,945,225, Cl. 250-214.00B.

Anderson, Edward, Jr., to Array Technologies, Inc. Electronic damping circuit. 4,945,294, Cl. 318-119.000.

Anderson, Philip A., to Outboard Marine Corporation. Alternator powered motor warning system. 4,945,338, Cl. 340-459.000.

Anderson, Thomas R., to Burr-Brown Corporation. Bias voltage generator and method. 4,945,259, Cl. 307-296.100.

Andersson, Borje, to SKF Nova AB. Bearing arrangement in rotary machines. 4,944,642, Cl. 408-241.00R.

Ando, Tsukasa: *See*—
Nonaka, Shiro; Hagino, Seiichiro; and Ando, Tsukasa, 4,944,237, Cl. 112-315.000.

Andou, Hironori: *See*—
Yamada, Syuji; and Andou, Hironori, 4,945,384, Cl. 355-51.000.

Andreasson, Bo C., to Aktiebolaget Electrolux. Arrangement in a fuel system. 4,944,897, Cl. 261-35.000.

Andrew Corporation: *See*—
Keyser, Lloyd A.; Nelson, Donald A.; and Thornton, David C., 4,944,776, Cl. 55-16.000.

Andrews, Peter: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter, 4,945,165, Cl. 548-362.000.

Anglehart, James. Guiding device for a computer mouse. 4,944,095, Cl. 33-403.000.

Anidjar, Morris: *See*—
Yazdani, Armand; and Anidjar, Morris, 4,945,457, Cl. 362-101.000.

Ankenbauer, Gerhard; and Hofmann, Heinrich, to FAG Kugelfischer Georg Schafer (KGaA). Die cast anti-friction bearing housing. 4,944,611, Cl. 384-476.000.

Annen, Klaus: *See*—
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, 4,945,064, Cl. 436-503.000.

Ansel, Robert E.: *See*—
Murphy, Edward J.; Ansel, Robert E.; and Krajewski, John J., 4,945,032, Cl. 430-394.000.

Anthony, Mark C.: *See*—
Farrell, Jonathon E.; and Anthony, Mark C., 4,945,344, Cl. 340-610.000.

Antos, John M.: *See*—
Sargent, Charles L.; and Antos, John M., 4,944,048, Cl. 4-323.000.

Aoki, Kozo: *See*—
Sakai, Minoru; Takahashi, Osamu; and Aoki, Kozo, 4,945,031, Cl. 430-393.000.

Apple Computer, Inc.: *See*—
Bruffey, Bill M.; Sidhu, Gursharan S.; Dirks, Patrick W.; and McFall, Christopher R., 4,945,475, Cl. 364-200.000.

Applied Vascular Devices: *See—*
Hilal, Said S.; and Cooper, Robert P., 4,944,726, Cl. 604-143.000.

Arai, Hiroyuki: *See—*
Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, 4,944,504, Cl. 271-171.000.

Arai, Naoki; and Kagawa, Kazuo, to Fuji Photo Film Co., Ltd. Silver halide photosensitive material. 4,945,036, Cl. 430-567.000.

Arai, Takeji, to Fanuc Ltd. Beam bender for use in a laser-beam machining apparatus. 4,945,206, Cl. 219-121.740.

Arai, Takeji, to Fanuc Ltd. Assist gas control method. 4,945,207, Cl. 219-121.840.

Arakawa, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Automotive carrier type conveying apparatus. 4,944,229, Cl. 104-137.000.

Araseki, Takashi: *See—*
Ozawa, Kazunori; and Araseki, Takashi, 4,945,565, Cl. 381-38.000.

Arch Development Corporation: *See—*
Fless, Gunther M.; and Scanu, Angelo M., 4,945,040, Cl. 435-7.000.

Arima, Shinichi, to Fuji Photo Film Co., Ltd. Division sheet feeding apparatus and method. 4,944,503, Cl. 270-95.000.

Arimura, Hirofumi: *See—*
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.

Arinobu, Ichiro: *See—*
Sugihara, Kazuyoshi; and Arinobu, Ichiro, 4,945,329, Cl. 335-219.000.

Arismendi, A. M., *Jr.*: *See—*
Jackson, John R., 4,945,310, Cl. 324-349.000.

Aristech Chemical Corporation: *See—*
Pugach, Joseph; and Salek, Jeffrey S., 4,945,184, Cl. 568-313.000.

Arita, Yoji, to Mitsubuishi Kasei. Actuator. 4,945,330, Cl. 335-229.000.

Armini, Anthony J.: *See—*
Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., 4,944,754, Cl. 623-16.000.

Armstrong, Brian J.: *See—*
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,944,774, Cl. 51-309.000.

Armstrong, Larry, to Reil Rock Products, Inc. Decorative panel with cutline. 4,944,124, Cl. 52-169.120.

Armstrong World Industries, Inc.: *See—*
Von Stetten, Susan M., 4,944,998, Cl. 428-327.000.

Aronson, Harold K. Electrostatic grounding system for work surfaces. 4,945,447, Cl. 361-212.000.

Arques, Marc, to Thomson-CSF. Matrix of photosensitive elements and radiation detector including such a matrix, especially double-energy X-ray detector. 4,945,243, Cl. 250-367.000.

Arques, Marc, to Thomson-CSF. Photosensitive matrix with two diodes and one capacitor per dot without optical resetting. 4,945,419, Cl. 358-213.110.

Arques, Marc: *See—*
Berger, Jean-Luc; and Arques, Marc, 4,945,242, Cl. 250-367.000.
Berger, Jean-Luc; and Arques, Marc, 4,945,420, Cl. 358-213.310.

Array Technologies, Inc.: *See—*
Anderson, Edward, Jr., 4,945,294, Cl. 318-119.000.

Asada, Masaaki: *See—*
Kitano, Seiichi; Asada, Masaaki; and Masaki, Michitomo, 4,944,380, Cl. 192-89.00B.

Asahi Glass Company Ltd.: *See—*
Ishikawa, Kenichi; Kurita, Koji; Fukawa, Satoru; and Maeda, Kenji, 4,944,822, Cl. 156-212.000.
Matsumoto, Yukio; and Kunii, Nobuaki, 4,945,149, Cl. 528-61.000.

Asahi Kogaku Kogyo K.K.: *See—*
Takahashi, Nagashige; and Ouchi, Teruo, 4,944,287, Cl. 128-4.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro; and Sato, Osamu, 4,945,376, Cl. 354-400.000.

Asahina, Yasuo: *See—*
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,945,022, Cl. 430-120.000.

Asakura, Tsutou: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 4,945,423, Cl. 358-300.000.

Asano, Hideki: *See—*
Nihei, Hideki; Miyashita, Kunio; and Asano, Hideki, 4,945,268, Cl. 310-12.000.

Asano, Kazuo; Taksi, Toshihiso; and Takito, Mitsuake, to Kabushiki Kaisha Asano Kenkyusho. Device for gripping and pulling softened plastic sheet at front and rear edges to be moldingly formed. 4,944,668, Cl. 425-397.000.

Asano, Yuji: *See—*
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.

Asari, Naosuke; and Sakamoto, Nobuyuki, to Seiko Instruments, Inc. Graphic display system. 4,945,499, Cl. 364-521.000.

Ascension Technology Corporation: *See—*
Blood, Ernest B., 4,945,305, Cl. 324-207.170.

Asea Brown Boveri Inc.: *See—*
Stroud, Nicholas J.; Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Basa, Thomas P., 4,945,333, Cl. 337-176.000.

Asplundh Tree Expert Co.: *See—*
Blasko, Andrew G., 4,944,364, Cl. 182-2.000.

Astec Industries, Inc.: *See—*
Edwards, M. Earl; and May, James G., 4,944,646, Cl. 414-332.000.

Asten, Wolfgang V.: *See—*
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, 4,945,004, Cl. 428-469.000.

AT&T Bell Laboratories: *See—*
Beltram, Fabio; Capasso, Federico; Malik, Roger J.; and Shah, Nitin J., 4,945,393, Cl. 357-23.500.
Blonder, Greg E.; and Johnson, Bertrand H., 4,945,400, Cl. 357-74.000.
Franey, John P., 4,944,916, Cl. 422-8.000.
Gagliano, Francis P.; and Hechtlinger, Solomon L., 4,944,979, Cl. 428-43.000.
Koch, Thomas L.; and Koren, Uziel, 4,944,838, Cl. 156-652.000.

Ataka, Tatsuaki: *See—*
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuaki, 4,945,515, Cl. 365-174.000.

Atech Aktiebolag: *See—*
Tyren, Carl H., 4,944,222, Cl. 101-93.290.

Atesys: *See—*
Cansell, Albert; and Raduleanu, Mihail, 4,945,449, Cl. 361-273.000.

Atlantic Richfield: *See—*
Lowther, Frank E., 4,945,306, Cl. 324-220.000.

Atlantic Richfield Company: *See—*
Grey, Roger A.; Karas, Lawrence J.; and Verkruyse, Linda A., 4,944,346, Cl. 166-274.000.
Spies, Brian R., 4,945,309, Cl. 324-345.000.

Au, William G.: *See—*
Gebhard, Albert W.; Knoedler, Roy E.; Parker, Robert M.; and Au, William G., 4,944,117, Cl. 49-55.000.

Audi AG.: *See—*
Backhaus, Hans-Gerd, 4,944,529, Cl. 280-743.000.

Audio Authority Corporation: *See—*
Gertz, Jonathan, 4,944,686, Cl. 439-175.000.

Aug. Winkhaus GmbH & Co. KG: *See—*
Kortenbrede, Ludger, 4,944,168, Cl. 70-49.000.

Auger, Gerard; Laurent, Pierre A.; and Mocchi, Patrick, to Thomson-CSF. Method and device for the demodulation of signals with constant envelope and continuous phase angle modulation by a train of binary symbols tolerating frequency drifts. 4,945,312, Cl. 329-345.000.

Augustine, Jeff: *See—*
Baucom, William E.; and Augustine, Jeff, 4,944,390, Cl. 206-44.00R.

Aurness, Harold O.; and Mahler, Thomas G. Expandable home package delivery box. 4,944,422, Cl. 220-20.000.

Autefa Maschinenfabrik GmbH: *See—*
Platzer, Kurt; Hirschek, Herwig; Schaller, Edwin; and Holzinger, Helmut, 4,944,502, Cl. 270-31.000.

Autoliv-Kolb, GmbH. & Co.: *See—*
Knabel, Walter; Mayer, Josef; and Wentker, Stephan, 4,944,531, Cl. 280-806.000.

Automated Packaging Systems, Inc.: *See—*
Gifford, Eric P.; and Roblin, William J., 4,944,825, Cl. 156-294.000.
Lerner, Hershey; and Lerner, Bernard, 4,945,252, Cl. 250-548.000.

Automobiles Citroen: *See—*
Coustre, Andree , 4,945,297, Cl. 318-558.000.

Automobiles Peugeot: *See—*
Coustre, Andree , 4,945,297, Cl. 318-558.000.

Avco Corporation: *See—*
Hovnanian, Camer V., 4,944,151, Cl. 60-39.320.

Avery International Corporation: *See—*
Mallya, Prakash; Ozari, Yehuda; and Smith, Colin C., 4,944,888, Cl. 210-787.000.

AVX Corporation: *See—*
Sturmer, John; and Cadwallader, John Y., 4,945,452, Cl. 361-529.000.

Awad, Sami B., to Henkel Corporation. Lubricant and surface conditioner for formed metal surfaces. 4,944,889, Cl. 252-32.500.

Ayers, Carlos R.: *See—*
Merickel, Michael B.; Carman, Charles S.; Brookeman, James R.; Mugler, John P., III; and Ayers, Carlos R., 4,945,478, Cl. 364-413.220.

Ayral-Kaloustian, Semiramis: *See—*
DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,945,158, Cl. 536-117.000.

Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See—*
Aiuola, Franco; and Piccinini, Renato, 4,944,138, Cl. 53-540.000.

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Backhaus, Hans-Gerd, to Audi AG. Inflatable protective cushion. 4,944,529, Cl. 280-743.000.

Bagshaw, John M.; Kent, Lionel W. J.; Willats, Terence F.; and Payne, Steven J., to General Electric Company, p.l.c., The. Acousto-optic tunable filter. 4,945,539, Cl. 372-13.000.

Baier & Koppel GmbH & Co.: *See—*
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Bailey, William D.: *See—*
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Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, to Hitachi, Ltd.; and Hitachi Device Engineering Co. High speed digital signal processor capable of achieving realtime operation. 4,945,506, Cl. 364-736.000.

Baker Hughes Incorporated: *See*—
Eriksen, Erik P. V.; Drakeley, Brian K.; and Carmody, Michael A., 4,944,351, Cl. 166-376.000.
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Baker, Martin C.: *See*—
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Baldwin, John J.; Remy, David C.; and Claremon, David A., to Merck & Co., Inc. Oculoselective beta-blockers. 4,945,182, Cl. 564-349.000.

Baldwin, Stanley L.; and Berscheid, Charles W., to INCO Limited. Butterfly valve for erosive fluid streams. 4,944,325, Cl. 137-375.000.

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Balliello, Paolo; Schilling, Otto; and Bruttel, Beat, to Ciba-Geigy Corporation. Solid formulation of anionic wool dyes with anionic dispersant and amphoteric surfactant: glycine or betaine. 4,944,768, Cl. 8-524.000.

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Balukin, Richard F.; Reiss, John R.; and Jerina, Frank J., to American Standard Inc. Brake valve device arranged for electro-pneumatic control. 4,944,564, Cl. 303-33.000.

Balzers Aktiengesellschaft: *See*—
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Barber-Greene Company: *See*—
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Barbucci, Rolando; Ferruti, Paolo; Grossi, Adalberto; and Lemm, Wilfried G., to G. Creamascoli S.p.A. Synthetic material apt to stably adsorb high quantities of heparin, and process for the production thereof. 4,944,767, Cl. 623-66.000.

Barcaro, Massimo: *See*—
Mistrorigo, Mario; Barcaro, Massimo; and Faccin, Andrea, 4,944,931, Cl. 423-386.000.

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Barlow, Joel W.: *See*—
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Barrett, Stephen B.; Bula, John; and Dean, Alvar A., to International Business Machines Corporation. Dual look ahead mask generator. 4,945,509, Cl. 364-900.000.

Bartholic, David B. Apparatus for upgrading liquid hydrocarbons. 4,944,845, Cl. 202-84.000.

Bartholomew, Alan; and Williams, Jack J., to Wagnon Power Jack, Inc. Tire pressure indicator. 4,944,323, Cl. 137-227.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Bleed-down connector assembly. 4,944,536, Cl. 285-319.000.

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Batista, Altair R. D.: *See*—
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Batts, Felix M.; and Walker, Joseph W. Fireman's helmet with integral front and rear lights. 4,945,458, Cl. 362-106.000.

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Baucom, William E.; and Augustine, Jeff, to Wooster Brush Company, The. Merchandising system for paint brushes and the like. 4,944,390, Cl. 206-44.00R.

Bauer, Jean-Michel; Maire, Jacques; and Verna, Maurice, to Le Carbone Lorraine. Separating element. 4,944,996, Cl. 428-307.700.

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Behlendorf, Donald J.; Keip, Frederick J.; and Benson, Robert L., to Bucyrus Erie Company. High production system bucket. 4,944,102, Cl. 37-135.000.

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Bell, Alan, to Steelpress (Supplies) Limited. Screw fastener cap. 4,944,644, Cl. 411-372.000.

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Bell, Frederick K.; Brown, Stephen N.; and Gale, Michael T., to Warner & Swasey Company, The. Method for determining position within the measuring volume of a coordinate measuring machine and the like and system therefor. 4,945,501, Cl. 364-571.050.

Belland, Terrance G., to Cornelius Company, The. Beverage dispenser for filling cups and extra-large receptacles with automatic dispensing shut off. 4,944,332, Cl. 141-1.000.

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Beloit Corporation: *See*—
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Belt, Roger F.; and Uhrin, Robert, to Litton Systems, Inc. Czochralski pulling of monocrystalline lanthanum orthogallate. 4,944,833, Cl. 156-617.100.

Beltram, Fabio; Capasso, Federico; Malik, Roger J.; and Shah, Nitin J., to AT&T Bell Laboratories. Floating gate memory circuit and apparatus. 4,945,393, Cl. 357-23.500.

Benach, Jose C.: *See*—
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Beneck, Jean A.; and Claude, Guayre, to Framatome. Nuclear fuel assembly structure compacting device. 4,944,911, Cl. 376-261.000.

Benejean, Richard, to Service Electricite de France National. Process and device for simulating a synchronous electric machine. 4,945,508, Cl. 364-802.000.

Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., to Chrysler Motors Corporation. Method of applying reverse gear in an automatic transmission. 4,944,200, Cl. 74-867.000.

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Berg, Dennis G., to Winfred M. Berg, Inc. Bearing seal and retainer. 4,944,610, Cl. 384-147.000.

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Berger, Fritz, to Elektro-Apparatebau Olten AG. Electric multiple switch assembly with pushbutton actuator and force transmitting insert. 4,945,194, Cl. 200-5.00R.

Berger, Jean-Luc; and Arques, Marc, to Thomson-CSF. Photosensitive device and image detector including such a device, especially two-energy image detector. 4,945,242, Cl. 250-367.000.

Berger, Jean-Luc; and Arques, Marc, to Thomson-CSF. Low noise reading method and circuit for line transfer photosensitive matrices. 4,945,420, Cl. 358-213.310.

Bergmann, Heather L.: *See*—
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Bickler, Henry A. Putting trainer device. 4,944,516, Cl. 273-183.00B.

Biddle, Ernest L., Jr.; Laesnig, John D.; and Oehrle, John B. Brinell hardness indicator with digital readout. 4,945,490, Cl. 364-506.000.

Biersach, James E., to Alerting Communicators of America. Energizing means for electronic warning apparatus. 4,945,334, Cl. 340-388.000.

Bindl, Jane M.: *See*—
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Biro, Alexander J., to Chelsea Industries, Inc. Welded window construction. 4,944,118, Cl. 49-504.000.

Bishop, Keith H.; and Blake, William S., to Schering Corporation. Manually-operable spray dispenser with locking mechanism. 4,944,429, Cl. 222-153.000.

Bishop, Robert J.; Fontecchio, Robert P.; Good, Stanley B.; and Hendrix, Troy C., to Allied-Signal Inc. Integral retainer, heat shield and assembly. 4,944,527, Cl. 280-741.000.

Black & Decker Inc.: *See*—
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Blackshear, David M. Surveillance camera system. 4,945,367, Cl. 354-81.000.

Blake, Graeme A.; Norling, Brian L.; and Novack, Mitchell J., to Sundstrand Data Control, Inc. Asymmetric flexure for pendulous accelerometer. 4,944,184, Cl. 73-514.000.

Blake, William S. Trigger sprayer with multi-function piston. 4,944,431, Cl. 222-276.000.

Blake, William S.: *See*—
Bishop, Keith H.; and Blake, William S., 4,944,429, Cl. 222-153.000.

Blanchette, Jeffrey J., to Motorola, Inc. System for cooperatively reassigning duties in a multiple controller environment. 4,945,355, Cl. 340-825.060.

Blankschein, Werner. Process and apparatus for producing bunches of artificial or natural brush material. 4,944,561, Cl. 300-10.000.

Blasko, Andrew G., to Asplundh Tree Expert Co. Boom elevating device for line lifts. 4,944,364, Cl. 182-2.000.

Blemberg, Robert J., to American National Can Company. Coextrusion apparatus, methods, and related films and packages. 4,944,972, Cl. 428-35.200.

Blic, Olivier: *See*—
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Blonder, Greg E.; and Johnson, Bertrand H., to AT&T Bell Laboratories. Subassembly for optoelectronic devices. 4,945,400, Cl. 357-74.000.

Blood, Ernest B., to Ascension Technology Corporation. Device for quantitatively measuring the relative position and orientation of two bodies in the presence of metals utilizing direct current magnetic fields. 4,945,305, Cl. 324-207.170.

Bloom, Kathryn Rowe: *See*—
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Bloom, Robert F., to Bloom, Kathryn Rowe. Surgical stencil and method of using the same. 4,944,737, Cl. 606-1.000.

Blotenberg, Wilfried, to MAN Gutehoffnungshutte GmbH. Process and device for the control of turbo compressors. 4,944,652, Cl. 415-27.000.

Blount, David H. Polymeric alkali metal silicate glass. 4,945,074, Cl. 501-53.000.

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Blumbach, Gotz-Peter; Brueckner, Willi; and Mueller, Rudolf, to Hoesch Aktiengesellschaft. Method and apparatus for the longitudinal deburring of sections. 4,944,080, Cl. 29-33.00A.

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Bockenheimer, Alexander: *See*—
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Bodine, John H.: *See*—
Stanley, Timothy D.; and Bodine, John H., 4,945,519, Cl. 367-48.000.

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Knecht, Adolf; Daab, Ottfried; and Weil, Hans-Hermann, 4,944,433, Cl. 222-402.200.

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Dick, Helmut; Gradel, Wolf-Dietrich; and Weber, Mathias, 4,945,181, Cl. 564-212.000.
Geiger, Thomas; and Engel, Wolf D., 4,945,042, Cl. 435-7.000.
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Brockschmidt, Arthur E., Jr.; and Jameson, Richard J., 4,945,442, Cl. 361-56.000.
Pinchbeck, Col'n; and Shorey, Thomas H., 4,944,563, Cl. 301-63.0DS.

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De Groot, Franciscus J.; De Swart, Jan W.; and Boerhoop, Jan, 4,944,092, Cl. 30-134.000.

Boesch, Martin: *See*—
Stoessl, Wilfried; Beusch, Christian; Boesch, Martin; and Niggli, Peter, 4,944,245, Cl. 118-726.000.

Boffelli, Pier C.: *See*—
Natale, Mario; and Boffelli, Pier C., 4,944,198, Cl. 74-813.00R.

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Moser, Hans; Bohner, Beat; and Fory, Werner, 4,944,790, Cl. 71-92.000.

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Bolan, Michael L., to Dallas Semiconductor Corporation. Hand-held wand for reading electronic tokens. 4,945,217, Cl. 235-472.000.

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Bolt, Reginald C., to Molins PLC. Cigarette ends testing. 4,944,314, Cl. 131-280.000.

Bond, Thomas: *See*—
Hancock, David; and Bond, Thomas, 4,945,214, Cl. 235-456.000.

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Kolich, Charles H.; Klobucar, W. Dirk; and Books, Jeffrey T., 4,945,139, Cl. 525-538.000.

Borek, Theodore S., Jr. Face mask with integral anti-glare, anti-fog eye shield. 4,944,294, Cl. 128-206.190.

Borland, Walter G. Resonant switching converter. 4,945,466, Cl. 363-97.000.

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Busche, David A.; and Bostian, David H., 4,944,409, Cl. 206-632.000.

Bott, John A. Article carrier. 4,944,439, Cl. 224-326.000.

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Guy, Bessey; and Bouchut, Jean-Yves, 4,944,206, Cl. 83-42.000.

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Bouhier, Bernard; and Butow, Bernd-Siegfried, to Hutchinson. Hydraulic vibration damping bushings. 4,944,482, Cl. 248-562.000.

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Bowers, Gary R.: *See*—
Hardiman, Christopher J.; and Bowers, Gary R., 4,945,143, Cl. 526-206.000.

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Boyle, Michael D. P.; and Faulmann, Ervin, to University of Florida. Novel Extraction procedure for protein G. 4,945,157, Cl. 530-409.000.

BP Chemicals Limited: *See*—
Gulliver, David J., 4,944,927, Cl. 423-22.000.

Bradford, William G.: *See*—
Osman, Akhtar; and Bradford, William G., 4,944,926, Cl. 423-22.000.

Brady, Dennis L. Exercise apparatus. 4,944,510, Cl. 272-133.000.

Bramhall, Robert B., Jr.; and Cloutier, Richard M., to Eaton Corporation. Platen assembly for a vacuum processing system. 4,944,860, Cl. 204-298.230.

Bramm, Gunter W.; and Olsen, Don B. Magnetically suspended and rotated rotor. 4,944,748, Cl. 623-3.000.

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Buschelberger, Hanns-Georg, 4,944,602, Cl. 366-337.000.

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Lunkenheimer, Winfried; Berg, Dieter; and Brandes, Wilhelm, 4,945,111, Cl. 514-521.000.

Brandle, Karl: *See*—
Van Royen, Luc; Putseys, Roland; Van Herck, Willy; Sluyts, Domien; Pype, Robert; and Brandle, Karl, 4,944,929, Cl. 423-235.000.

Brandt, Inc.: *See*—
Sherman, William, III, 4,944,505, Cl. 271-265.000.

Brandt Industries, Ltd.: *See*—
Karchewski, John, 4,944,355, Cl. 172-278.000.

Bratvold, Darrell E.: *See*—
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Bremenour, Edwin L.; Tratar, Michael F.; and Pepera, Gerald S., to Allen-Bradley Company, Inc. Memory cartridge for a circuit board module. 4,945,448, Cl. 361-383.000.

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Marshall, William B.; Pribish, James R.; and Brewbaker, James L., 4,945,150, Cl. 528-193.000.

Brewer, Mark. Oscillating device for fluid nozzles. 4,944,457, Cl. 239-242.000.

Brewster, Steven L.: *See*—
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; Brewster, Steven L.; and Higgins, George C., 4,944,999, Cl. 428-371.000.

Bridgestone Corporation: *See*—
Nishikawa, Tomohisa; and Oshima, Kazuo, 4,944,821, Cl. 156-161.000.
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 4,945,002, Cl. 428-425.600.

Briggs, Stuart J., to Lucas Industries Public Limited Company. Brake servo booster. 4,944,214, Cl. 92-98.00R.

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Griesbaum, Theodore J.; Lydic-Mettler, Joan S.; Flores, Pamela A.; Jasek, Anthony B.; and Wrzesinski-Conran, Mary A., 4,944,556, Cl. 297-437.000.

Brilka, Joachim C.; and Weltersbach, Wolfgang, to U.S. Philips Corporation. Synchronous demodulator having automatically tuned bandpass filter. 4,945,313, Cl. 329-349.000.

Brill, Henry L., to Pittway Corporation. Tamper-resistant magnetic security system. 4,945,340, Cl. 340-547.000.

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Villette, Alain, 4,944,678, Cl. 433-224.000.

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Wedge, Philip J.; and Wharmby, David, 4,944,674, Cl. 432-158.000.

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Brock, James D.; Smith, Donald W.; and Bassett, James H., to Barber-Greene Company. Connector and method of connection between a road making machine and the fifth wheel of a tractor. 4,944,630, Cl. 404-83.000.

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Brohammer, Lawrence F. Removable spindle for drill heads. 4,944,638, Cl. 408-59.000.

Brokken, Kyle; and Porubcan, Randolph S., to Quali Tech, Inc. Membrame-forming veterinary antibacterial teat dip. 4,945,110, Cl. 514-517.000.

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Brookeman, James R.: *See*—
Merickel, Michael B.; Carman, Charles S.; Brookeman, James R.; Mugler, John P., III; and Ayers, Carlos R., 4,945,478, Cl. 364-413.220.

Brooks, John F.; and Farnese, Paul L., to Electrothermal Engineering. Apparatus for monitoring temperature dependent changes. 4,945,211, Cl. 219-385.000.

Brooks, William M.: *See*—
Doddrell, David M.; and Brooks, William M., 4,945,308, Cl. 324-309.000.

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Mallory, Chester L.; Wasserman, Phillip D.; Pham, Hung V.; and Broome, Barry G., 4,945,220, Cl. 250-201.300.

Brother Kogyo Kabushiki Kaisha: *See*—
Kato, Shigeki; and Suzuki, Yoshihumi, 4,944,615, Cl. 400-124.000.
Sakai, Toshio; and Akao, Michitoshi, 4,945,222, Cl. 250-205.000.
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.

Brothers, Louis R., to Massachusetts Institute of Technology. Laser diode modulator. 4,945,542, Cl. 372-38.000.

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Brouwer, Gerardus J.; and Zwambag, Henry, 4,944,352, Cl. 172-19.000.

Brown, Frederick J.: *See*—
Stroud, Nicholas J.; Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Basa, Thomas P., 4,945,333, Cl. 337-176.000.

Brown, Karen K.; and Bryant, Sharon A., to Mobay Corporation. Intranasal vaccination of horses with inactivated microorganisms or antigenic material. 4,944,942, Cl. 424-89.000.

Brown, Lowell E.: *See*—
Rusterholz, John T.; Homan, Charles J.; Brown, Lowell E.; Bennett, Donald B.; Malnati, Robert J.; and Hamstra, James R., 4,945,479, Cl. 364-200.000.

Brown, Michael B.; Ebert, William S.; Olson, Leonard T.; and Sloma, Richard R., to International Business Machines Corporation. Electronic package with integrated distributed decoupling capacitors. 4,945,399, Cl. 357-74.000.

Brown, Stephen N.: *See*—
Bell, Frederick K.; Brown, Stephen N.; and Gale, Michael T., 4,945,501, Cl. 364-571.050.

Broyden, Robert H.: *See*—
Schroeder, Roger A.; Broyden, Robert H.; Dearstyne, Robert C.; Magner, Joseph L.; Gephart, Randall J.; Dayton, David W.; and Newman, Raymond A., 4,944,056, Cl. 5-81.00R.

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Blumbach, Gotz-Peter; Brueckner, Willi; and Mueller, Rudolf, 4,944,080, Cl. 29-33.00A.

Bruffey, Bill M.; Sidhu, Gursharan S.; Dirks, Patrick W.; and McFall, Christopher R., to Apple Computer, Inc. Hierarchical file system to provide cataloging and retrieval of data. 4,945,475, Cl. 364-200.000.

Bruggestrath, Bernd: *See*—
Adams, Horst H.; Bruggestrath, Bernd; and Kappe, Rudolf A., 4,944,489, Cl. 251-306.000.

Brumenshenkel, Elmer L.: *See*—
Drown, Donald L.; Runge, Richard O.; and Brumenshenkel, Elmer L., 4,944,550, Cl. 296-100.000.

Brumsack, Hans-Jurgen: *See*—
Heinrichs, Hartmut; Brumsack, Hans-Jurgen; Loftfield, Norman; and Konig, Nils, 4,944,923, Cl. 422-102.000.

Brun, Bernard; and Dupont, Pierre, to Pernod Ricard. New ethanolic compositions containing anethole. 4,944,956, Cl. 426-592.000.

Brundage, Robert W. Solenoid controlled valve. 4,944,328, Cl. 137-528.000.

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Bruttel, Best: *See*—
Balliello, Paolo; Schilling, Otto; and Bruttel, Best, 4,944,768, Cl. 8-524.000.

Bruylants, Paul P.; Corcoran, Patrick H.; and Simms, John A., to Du Pont de Nemours, E. I., and Company. Silane coating composition for ambient cure. 4,945,145, Cl. 526-279.000.

Bryant, David R.: *See*—
Papa, Anthony J.; and Bryant, David R., 4,945,185, Cl. 568-387.000.

Bryant, Sharon A.: *See*—
Brown, Karen K.; and Bryant, Sharon A., 4,944,942, Cl. 424-89.000.

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Widmann, Marcel; and Hickey, James H., 4,945,000, Cl. 428-407.000.

Buchbinder, Maurice; and Solar, Ronald J., to Medtronic Versaflex, Inc. Outer exchange catheter system. 4,944,740, Cl. 606-194.000.

Buchel, Karl H.: *See*—
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,945,101, Cl. 514-383.000.

Buchholz, Rainer: *See*—
Zodrow, Rudolf; Regail, Wolfgang; Hoveler, Egon; and Buchholz, Rainer, 4,944,830, Cl. 156-567.000.

Buchko, Raymond G., to Curwood, Inc. Web retention and advancement mechanism. 4,944,442, Cl. 226-171.000.

Buck, David W.; and Bindl, Jane M., to Becton, Dickinson and Company. L60: a novel monoclonal antibody. 4,945,056, Cl. 435-240.270.

Buckberg, Gerald D.; Maloney, James V., Jr.; Jones, Kenneth A.; and West, Weldon D., to Shiley, Inc. Femoral arterial cannula. 4,944,729, Cl. 604-164.000.

Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., to Hoechst Celanese Corp. Process for producing liquid crystalline composites. 4,944,895, Cl. 252-299.010.

Buckley, Alan: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,944,896, Cl. 252-587.000.

Buckman Laboratories International, Inc.: *See*—
Rayudu, S. Rao, 4,945,109, Cl. 514-478.000.

Bucyrus Erie Company: *See*—
Behlendorf, Donald J.; Keip, Frederick J.; and Benson, Robert L., 4,944,102, Cl. 37-135.000.

Budenbender, Bernd. Method of and apparatus for the welding of thin sheet metal workpieces. 4,945,202, Cl. 219-121.630.

Buenos, Anne M.; Buenos, Jane M.; and Sylverst, Leroy M. Cuff constructions. 4,944,041, Cl. 2-84.000.

Buenos, Jane M.: *See*—
Buenos, Anne M.; Buenos, Jane M.; and Sylverst, Leroy M., 4,944,041, Cl. 2-84.000.

Buford, John C.; and Porter, Leslie H., to Manville Corporation. Multicelled enclosed carton. 4,944,405, Cl. 206-614.000.

Bugga, Ratnakumar V.; Distefano, Salvador; Nagasubramanian, Ganesan; and Bankston, Clyde P., to United States of America, Administrator, National Aeronautics and Space Administration. Copper chloride cathode for a secondary battery. 4,945,012, Cl. 429-103.000.

Bula, John: *See*—
Barrett, Stephen B.; Bula, John; and Dean, Alvar A., 4,945,509, Cl. 364-900.000.

Bull HN Information Systems Inc.: *See*—
Holtey, Thomas O.; Murray, Thomas L., Jr.; Smith, Scott W.; and Perzan, Wayne A., 4,945,473, Cl. 364-200.000.

Bull, S.A.: *See*—
Hald, Andre , 4,945,532, Cl. 370-13.000.

Bullat, David M.; and Thomas, Willie L., to United States of America, Navy. Preset restraining device. 4,944,074, Cl. 24-602.000.

Bunse, Wolfgang; Ernst, Hans-Otto; Droste, Heinz; Kalze, Franz-Josef; and Peitz, Wolfgang, to Hella KG Hueck & Co. Reflector for dimmed or dimmable motor vehicle headlights. 4,945,454, Cl. 362-61.000.

Burdick Corporation: *See*—
Uecker, Kenneth D., 4,944,621, Cl. 400-691.000.

Burgess, Frank M.; and Burgess, Neal B. Method for producing retrosternal space. 4,944,753, Cl. 623-16.000.

Burgess, Neal B.: *See*—
Burgess, Frank M.; and Burgess, Neal B., 4,944,753, Cl. 623-16.000.

Burgio, Paul A.; and Nelms, C. Randall, Jr. Plush toy with ear system for displaying normal and abnormal eardrums. 4,944,681, Cl. 434-270.000.

Burk, Gary N., to Process Automation Business, Inc. Apparatus and method for measuring dark and bright reflectances of sheet material. 4,944,594, Cl. 356-446.000.

Burke, Desmond C. Bucket conveyor system. 4,944,387, Cl. 198-706.000.

Burkholder, Amy: *See*—
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Burlington Northern Railroad, a wholly owned subsidiary of Burlington Northern, Inc.: *See*—
Schlaeger, Gary D., 4,944,232, Cl. 105-355.000.

Burns, Eugene A.: *See*—
Colby, Brace N.; and Burns, Eugene A., 4,944,921, Cl. 422-70.000.

Burns, Gary T.; and Zank, Gregg A., to Dow Corning Corporation. Preceramic metallopolysilanes. 4,945,072, Cl. 501-88.000.

Burr-Brown Corporation: *See*—
Anderson, Thomas R., 4,945,259, Cl. 307-296.100.

Burton, Charlie E.; and McKay, James H. Fish attractor and bug killer. 4,944,114, Cl. 43-113.000.

Busche, David A.; and Bostian, David H., to Curwood, Inc. Easy open package. 4,944,409, Cl. 206-632.000.

Buschelberger, Hanns-Georg, to Bran & Luebbe GmbH. High pressure homogenizing apparatus. 4,944,602, Cl. 366-337.000.

Bush, Janet. Team designator belts. 4,944,043, Cl. 2-308.000.

Butler, Janis Y.; and Fuhrman, Esther. Convertible earring. 4,944,164, Cl. 63-12.000.

Butler, Lee D.: *See*—
Orlando, Franklin P.; Butler, Lee D.; Luttrell, Donald A.; and Goulart, Joseph S., 4,944,141, Cl. 56-17.100.

Butow, Bernd-Siegfried: *See*—
Bouhier, Bernard; and Butow, Bernd-Siegfried, 4,944,482, Cl. 248-562.000.

Buttery, John R.: *See*—
Doman, Trevor D.; Buttery, John R.; and Gould, Royston M., 4,944,359, Cl. 180-208.000.

Buttimer, Gregory J. Alarm system for electrical devices. 4,945,341, Cl. 340-568.000.

Buttner, Willibald, to Baier & Koppel GmbH & Co. Lubrication pump with an adjustable metering device. 4,944,658, Cl. 417-274.000.

Buyukliev, Georgi S.: *See*—
Lyakov, Nedyalko K.; Haralampiev, Georgi A.; Nikolov, Todor G.; Buyukliev, Georgi S.; Petrov, Peter S.; Valchev, Peter V.; Myuftiev, Valcho P.; and Primov, Kalin T., 4,944,869, Cl. 209-173.000.

C & K Components, Inc.: *See*—
Ipcinski, Ralph, 4,945,195, Cl. 200-6.00B.
Jones, Raymond, 4,945,353, Cl. 340-825.070.

C. R. Bard, Inc.: *See*—
Akerfeldt, Dan, 4,944,308, Cl. 128-751.000.

Cableware Pty. Ltd.: *See*—
Jackson, Raymond T., 4,945,188, Cl. 174-16.200.

Cadwallader, John Y.: *See*—
Stormer, John; and Cadwallader, John Y., 4,945,452, Cl. 361-529.000.

Cain, Alan, to Shark-fin Products, Inc. Housing rudder for electric trolling motor. 4,944,702, Cl. 440-51.000.

Calaresu, Paolo: *See*—
Messina, Giuseppe; Calaresu, Paolo; and Lorenzoni, Loreno, 4,945,161, Cl. 544-401.000.

California Institute of Technology: *See*—
Grubbs, Robert H.; and Novak, Bruce M., 4,945,135, Cl. 525-338.000.
Grubbs, Robert H.; and Novak, Bruce M., 4,945,141, Cl. 526-90.000.
Grubbs, Robert H.; and Novak, Bruce M., 4,945,144, Cl. 526-268.000.
Gupta, Amitava; Liang, Ranty H.; and Yavrouian, Andre H., 4,945,001, Cl. 428-412.000.

Calvert, Nathaniel, to IN Motion, Inc. Sewing thimble. 4,944,437, Cl. 223-101.000.

Campbell, Christopher J., to Philip Morris Incorporated. Cigarette carton insert. 4,944,394, Cl. 206-256.000.

Campbell, David L.: *See*—
Naghshineh, Kanoosh; and Campbell, David L., 4,945,260, Cl. 307-296.600.

Casela, Heriberto. Board game for memorizing messages, slogans or phrases. 4,944,519, Cl. 273-243.000.

Canon Kabushiki Kaisha: *See*—
Date, Nobuaki; Sunouchi, Akio; Saito, Syuichiro; Murata, Yoshitaka; Ogawa, Yukio; and Tezuka, Nobuo, 4,945,379, Cl. 354-441.000.
Kimura, Akiyoshi, 4,945,385, Cl. 355-202.000.
Oguchi, Yoshihiro; and Santoh, Tsuyoshi, 4,944,981, Cl. 428-64.000.
Suzuki, Koji; Nagahira, George; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,945,255, Cl. 307-17.000.

Cansell, Albert; and Raduleanu, Mihail, to Atesys. High voltage capacitor with high energy density. 4,945,449, Cl. 361-273.000.

Cant, Norman H.: *See*—
Labelle, H. M. Robert; Cant, Norman H.; and Garrow, Cecil M., 4,944,169, Cl. 70-100.000.

Cap Toys, Inc.: *See*—
Osher, John D.; Katzman, Allison W.; Luecke, Mark; and Wildman, John R., 4,944,363, Cl. 273-58.00A.

Capasso, Federico: *See*—
Beltram, Fabio; Capasso, Federico; Malik, Roger J.; and Shah, Nitin J., 4,945,393, Cl. 357-23.500.

Cappuzzo, Doris J.; and Cappuzzo, John D. Animal repellent trash bag. 4,944,393, Cl. 206-205.000.

Cappuzzo, John D.: *See*—
Cappuzzo, Doris J.; and Cappuzzo, John D., 4,944,393, Cl. 206-205.000.

Carbocol, Inc.: *See*—
Stofko, John, 4,944,823, Cl. 156-283.000.

Cardin, Joseph M.; Fremy, Raoul; and Griffin, Patrick K., to Moog Inc., a part interest. Automatically-operated redundant-type fluid coupling device. 4,944,329, Cl. 137-614.050.

Carignan, Roger G.: *See*—
Martinez, David M.; Carignan, Roger G.; and Stulberg, S. David, 4,944,757, Cl. 623-20.000.

Carl Schenck AG: *See*—
Storck, Karlheinz, 4,944,714, Cl. 474-91.000.

Carlier, Michel; and Blic, Olivier, to Oerlikon Motch Corporation. Method and device for accumulating objects in a pneumatic conveyance system. 4,944,635, Cl. 406-10.000.

Carlier, Michel; and Bernard, Frederic, to Oerlikon Motch Corporation. Method and device for the transferring and accumulating of packing elements by air conveying. 4,944,636, Cl. 406-72.000.

Carlin, Edward J.: *See*—
Talwar, Anil K.; and Carlin, Edward J., 4,945,087, Cl. 514-60.000.

Carlin, Richard T.: *See*—
Dunbobbin, Brian R.; Carlin, Richard T.; and Cassano, Anthony A., 4,944,934, Cl. 423-579.000.

Carlson, Dennis L.: *See*—
Fingerson, Conrad F.; Nelson, Bruce A.; Carlson, Dennis L.; and Eickhoff, Robert D., 4,944,520, Cl. 273-419.000.

Carlsson, Bo P. I.; and Svensson, Ulf M., to Aktiebolaget Electrolux. Carburetor arrangement. 4,944,272, Cl. 123-438.000.

Carlsson, Lars C.; Stark, Sven O. S.; and Bengtsson, Ulf, to AB Tetra Pak. Apparatus for the sterile packaging of contents. 4,944,132, Cl. 53-167.000.

Carman, Charles S.: *See*—
Merickel, Michael B.; Carman, Charles S.; Brookeman, James R.; Mugler, John P., III; and Ayers, Carlos R., 4,945,478, Cl. 364-413.220.

Carmody, Michael A.: *See*—
Eriksen, Erik P. V.; Drakeley, Brian K.; and Carmody, Michael A., 4,944,351, Cl. 166-376.000.

Carnahan, Gayle A.: *See*—
Carnahan, Monte; and Carnahan, Gayle A., 4,944,058, Cl. 5-90.000.

Carnahan, Monte; and Carnahan, Gayle A. Integrated mattress and flush commode. 4,944,058, Cl. 5-90.000.

Carper, Dwight A., to Whirlpool Corporation. Refrigerator shelf accessory mounting system. 4,944,566, Cl. 312-311.000.

Carr, Owen R., to Univ. of British Columbia. Panel wiring connector. 4,944,689, Cl. 439-417.000.

Carrell, Michael W.; and Gericke, Stephen H., to Safe Medical Devices, Inc. Intravenous catheter placement device. 4,944,728, Cl. 604-164.000.

Carrier Corporation: *See*—
Chou, S.-T. Rudy; and Hogan, Mark R., 4,944,654, Cl. 415-211.200.

Carriker, John W.; and Wampler, Richard K., to Nimbus Medical, Inc. Percutaneous axial flow blood pump. 4,944,722, Cl. 600-16.000.

Carson, David M., to Du Pont de Nemours, E. I., and Company. Cavity sealing system for a centrifuge rotor. 4,944,721, Cl. 494-16.000.

Carson, Mark E.; and Johri, Abhai, to International Business Machines Corporation. Trusted path mechanism for virtual terminal environments. 4,945,468, Cl. 364-200.000.

Carter, Duane E., to Texas Instruments, Incorporated. Organic space holder for trench processing. 4,945,069, Cl. 437-67.000.

Carter, John A. Engine vacuum-condition responsive safety system. 4,944,241, Cl. 114-211.000.

Carter, Melvin K.: *See*—
Toy, Madeline S.; and Carter, Melvin K., 4,945,063, Cl. 436-85.000.

Carter, William A., to HEM Research, Inc. Controlled dsRNA therapy for human viral infections. 4,945,082, Cl. 514-44.000.

Carver, Larry L.; Zamzow, Charles E.; Mladenoff, Donald D.; and Lovrien, Glenn A., to Northrop Corporation. Integrated aircraft manufacturing system. 4,945,488, Cl. 364-474.240.

Casale, Larry. Diaper for use in toilet training male children or for use by incontinent male adults. 4,944,733, Cl. 604-385.100.

Casio Computer Co., Ltd.: *See*—
Hiroki, Keiichiro; Fukasawa, Yukihiko; and Yamauchi, Ken, 4,945,424, Cl. 358-335.000.
Nakama, Masato; and Hidaka, Norihiro, 4,945,504, Cl. 364-709.110.
Yoshida, Tetsushi; and Kozima, Ken, 4,944,577, Cl. 350-346.000.

Cassano, Anthony A.: *See*—
Dunbobbin, Brian R.; Carlin, Richard T.; and Cassano, Anthony A., 4,944,934, Cl. 423-579.000.

Casse, Pierre; and Bionaz, Jean, to Valeo. Lock up clutch for a hydrokinetic coupling apparatus, especially for an automotive vehicle. 4,944,374, Cl. 192-3.290.

Castleman, Robert D. Electronic infrared detector. 4,945,244, Cl. 250-370.010.

Catanese, John A.; and Saunders, Susan R., to Westinghouse Electric Corp. Electrolytic etching apparatus and method for marking metal tubes with sequential identification numbers. 4,944,856, Cl. 204-129.200.

Caterpillar Inc.: *See*—
Richardson, Ronald D., 4,944,259, Cl. 123-169.0PA.

Caterpillar Industrial Inc.: *See*—
Wible, John E.; and Grohsmeyer, Paul D., 4,944,357, Cl. 180-169.000.

Catheter Research, Inc.: *See*—
McCoy, William C., 4,944,727, Cl. 604-95.000.

Cavallerano, Alan P.; Basile, Carlo; and Tsinberg, Mikhail, to North American Philips Corporation. HDNTSC channel with time and frequency multiplexing. 4,945,411, Cl. 358-141.000.

Cavender, Travis W.: *See*—
Whiteley, Thomas G.; and Cavender, Travis W., 4,944,348, Cl. 166-278.000.

Celanese Corporation: *See*—
Felton, Clinton D.; Gibson, Baylor D.; Jamison, Charles E.; McWhorter, William O.; and Serad, George A., 4,944,854, Cl. 204-168.000.
Center for Innovative Technology: *See*—
Merickel, Michael B.; Carman, Charles S.; Brookeman, James R.; Mugler, John P., III; and Ayers, Carlos R., 4,945,478, Cl. 364-413.220.
Wist, Abund O.; Pandey, Ramendra N.; and Fatouros, Panos P., 4,945,239, Cl. 250-358.100.
Central Sekiyu Gas Kabushiki Kaisha: *See*—
Kajino, Hideo; and Matsuo, Kazuo, 4,944,324, Cl. 137-113.000.
Ceriale, James M.: *See*—
Truty, Thomas J.; Fricke, William R.; Ceriale, James M.; French, Jule L.; and Newell, Kevin M., 4,945,200, Cl. 219-69.120.
Chagnon, Mark S.; and Ferris, John R., to Omni Quest Corporation. High coercivity magnetic inks and method for making same. 4,944,802, Cl. 106-20.000.
Chambers, Warren D.; and Jurczak, Jeffrey T., to Allied-Signal Inc. Drum drive for use with multiple disc brakes. 4,944,370, Cl. 188-71.500.
Champion Spark Plug Europe S.A.: *See*—
Verton, Jose, 4,944,064, Cl. 15-250.420.
Chance, Nathan H., Jr.: *See*—
Waite, Diana H.; Chance, Nathan H., Jr.; and Edmiston, Robert A., 4,944,320, Cl. 134-167.00C.
Chandler, John W. Compartmentalized refuse container. 4,944,419, Cl. 220-1.00T.
Chang, Loong-Tun: *See*—
Chern, Tian P., 4,945,278, Cl. 315-209.00R.
Che, Tessie M.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Staetz, Dagobert E.; and Ulrich, Donald R., 4,944,895, Cl. 252-299.010.
Chelsea Industries, Inc.: *See*—
Biro, Alexander J., 4,944,118, Cl. 49-504.000.
Chen, Fu, to Betz Laboratories, Inc. Water treatment polymers and methods of use thereof. 4,944,885, Cl. 210-701.000.
Chen, Nai Y.; Ketkar, Anil B.; and Partridge, Randall D., to Mobil Oil Corporation. Integrated catalytic dewaxing and catalytic cracking process. 4,944,862, Cl. 208-49.000.
Chern, Tian P., to Chang, Loong-Tun. Fluorescent tube power supply. 4,945,278, Cl. 315-209.00R.
Cherry, David J.: *See*—
Aleckner, John F., Jr.; Cherry, David J.; and Spencer, Lee R., Jr., 4,945,005, Cl. 428-500.000.
Chevron Research Company: *See*—
Occelli, Mario L.; and Kennedy, James V., 4,944,865, Cl. 208-121.000.
Chiang, Ching, to Bionostics Incorporated. Control for blood gas/calcium analysis instrumentation. 4,945,062, Cl. 436-11.000.
Chikamasa, Hiroshi: *See*—
Sugiyama, Tuyoshi; Takeda, Hideo; Sato, Tsunehiko; and Chikamasa, Hiroshi, 4,944,808, Cl. 134-15.000.
Child, Robin E., to Concentric Pumps Limited. Reversible geroter pump with pivoting carrier unidirectional flow. 4,944,662, Cl. 418-32.000.
Cho, Hyun S., to General Electric Company. Fabrication of supported polycrystalline abrasive compacts. 4,944,772, Cl. 51-293.000.
Chollet, Patrick: *See*—
Moisan, Monique; Pavy, Dominique; Davoust, Marie-Eve; Saada, Serge; and Chollet, Patrick, 4,944,244, Cl. 118-723.000.
Chou, Ray-Shun: *See*—
Hwang, Chiang-Tung; and Chou, Ray-Shun, 4,945,303, Cl. 324-78.00D.
Chou, S.-T. Rudy; and Hogan, Mark R., to Carrier Corporation. Split scroll for centrifugal blower. 4,944,654, Cl. 415-211.200.
Christenson, Leland G., II. Buck lure. 4,944,940, Cl. 424-84.000.
Christian, Klaus, to Zahnradfabrik Friedrichshafen AG. Synchronizing ring. 4,944,378, Cl. 192-107.00M.
Christian, Victorion; and Jacques, Guionnet, to Establissement Public de Diffusion dit "Telediffusion de France" . Process for the scrambling and descrambling of television images. 4,945,564, Cl. 380-14.000.
Chrysler Corporation: *See*—
Davey, Mark A., 4,944,265, Cl. 123-196.00R.
Gatt, Edward W., 4,944,398, Cl. 206-507.000.
Medley, Edward H.; Kreucher, Raymond N., Jr.; Stedman, Dennis F.; and Downs, Thomas R., 4,944,553, Cl. 296-188.000.
Chrysler Motors Corporation: *See*—
Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., 4,944,200, Cl. 74-867.000.
Ciba-Geigy Corporation: *See*—
Balliello, Paolo; Schilling, Otto; and Bruttel, Beat, 4,944,768, Cl. 8-524.000.
Bencze, William; Frostl, Wolfgang; and Wilhelm, Max, 4,945,092, Cl. 514-252.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,792, Cl. 71-92.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,793, Cl. 71-93.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,794, Cl. 71-93.000.
Moser, Hans; Bohner, Beat; and Fory, Werner, 4,944,790, Cl. 71-92.000.
Nyfeler, Robert; Zondler, Helmut; and Sturm, Elmar, 4,945,100, Cl. 514-383.000.
Citizen Watch Co., Ltd.: *See*—
Kashio, Tadashi, 4,945,331, Cl. 335-274.000.
Claremon, David A.: *See*—
Baldwin, John J.; Remy, David C.; and Claremon, David A., 4,945,182, Cl. 564-349.000.
Clarion Co., Ltd.: *See*—
Harada, Masaaki, 4,945,537, Cl. 371-37.100.
Clark, Abbot F., to Alcon Laboratories, Inc. Use of tetrahydrocortexolone to prevent elevations in intraocular pressure caused by corticosteroids. 4,945,089, Cl. 514-171.000.
Clark, Carl E.; Ganek, Alan G.; Mall, Michael G.; and Page, David R., to International Business Machines Corporation. Data domain switching on program address space switching and return. 4,945,480, Cl. 364-200.000.
Clark, Mary J.; and Hankison, Paul M. Cracker and condiment bowl. 4,944,423, Cl. 220-20.000.
Clark, William G., Jr.; and Junker, Warren R., to Westinghouse Electric Corp. System and method for qualitatively and nondestructively inspecting adhesive joints and other materials. 4,944,185, Cl. 73-579.000.
Clary, John G.: *See*—
Scozzafava, Milton; and Clary, John G., 4,944,620, Cl. 400-608.100.
Claude, Guayre: *See*—
Beneck, Jean A.; and Claude, Guayre, 4,944,911, Cl. 376-261.000.
Claus, Thomas H.: *See*—
DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,945,158, Cl. 536-117.000.
Clayson, Peter D., to Alberta Ltd. Gate valve. 4,944,488, Cl. 251-203.000.
Clear, Theodore E., to Dow Chemical Company, The. Composite building panel and methods. 4,944,127, Cl. 52-309.120.
Clecim: *See*—
Guy, Bessey; and Bouchut, Jean-Yves, 4,944,206, Cl. 83-42.000.
Clemow, Alastair J. T.; Jaeger, Scott H.; and Ritchie, Allan, to Johnson & Johnson Orthopaedics, Inc. Bone pin. 4,944,742, Cl. 606-59.000.
Cloutier, Richard M.: *See*—
Bramhall, Robert B., Jr.; and Cloutier, Richard M., 4,944,860, Cl. 204-298.230.
CMB Packaging (UK) Limited: *See*—
Heyes, Peter J.; and Middleton, Nicholas J., 4,945,008, Cl. 428-623.000.
Coalier, Guy; and Serre, Jean-Claude, to Embal-Systems. Blank of material in sheet form and partition made therefrom. 4,945,007, Cl. 428-542.800.
Coates, George J. Spherical rotary valve assembly for an internal combustion engine. 4,944,261, Cl. 123-190.00D.
Cobb, Stephen H.: *See*—
Gole, James L.; Woodward, James R.; and Cobb, Stephen H., 4,945,546, Cl. 372-89.000.
Cobian, Kenneth E.: *See*—
Doan, Phong D.; Cobian, Kenneth E.; Upton, James E.; and Haeg, Daniel C., 4,944,088, Cl. 29-858.000.
Coca-Cola Company, The: *See*—
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,944,335, Cl. 141-95.000.
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,944,336, Cl. 141-95.000.
Cochlear Corporation: *See*—
Widin, Gregory P.; and van den Honert, Christopher, 4,944,301, Cl. 128-420.600.
Coenen, Herbert: *See*—
Langen, Hans; Fartmann, Norbert; and Coenen, Herbert, 4,944,354, Cl. 172-47.000.
Cohen, Michael. Method of treating pre-menstrual syndrome. 4,945,103, Cl. 514-419.000.
Cok, David R., to Eastman Kodak Company. Apparatus and accompanying methods for achieving automatic color balancing in a film to video transfer system. 4,945,406, Cl. 358-80.000.
Colby, Bruce N.; and Burns, Eugene A., to Maxwell Laboratories. Automated PCB analyzer system. 4,944,921, Cl. 422-70.000.
Colby, Paul N.; and Durina, Michael F., to Spirex Corporation. Methods of injection molding and extruding wet hygroscopic ionomers. 4,944,906, Cl. 264-101.000.
Cole, John. Needle protection. 4,944,731, Cl. 604-192.000.
Colgate-Palmolive Company: *See*—
Potini, A. Chimpirama, 4,944,938, Cl. 424-68.000.
Colin Electronics Co., Ltd.: *See*—
Takatsu, Nariyasu; and Nakashima, Hidenobu, 4,944,305, Cl. 128-683.000.
Collins, Jayson H. Shoulder rehabilitation device. 4,944,508, Cl. 272-132.000.
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., to Keptel, Inc. Telephone network interface apparatus. 4,945,559, Cl. 379-399.000.
Collins, Thomas J.; and Quintana, Peter, to Keptel, Inc. Telephone network interface apparatus. 4,945,560, Cl. 379-399.000.
Colt Industries Inc: *See*—
House, William J.; Kline, Loren H.; and McAuliffe, Lawrence, Jr., 4,944,276, Cl. 123-520.000.
Combined Optical Industries Limited: *See*—
Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., 4,944,574, Cl. 350-245.000.

Commissariat a l'Energie Atomique: *See—*
Fougnot, Christine; Jozefowicz, Marcel; and Rosenberg, Robert D., 4,945,054, Cl. 435-214.000.
Michon, Maurice, 4,944,573, Cl. 350-173.000.
Salgues, Pierre; and Verrecchia, Roger, 4,945,416, Cl. 358-209.000.
Sibuet, Henri, 4,944,831, Cl. 156-643.000.

Compagnie Generale des Etablisaements Michelin - Michelin et Cie: *See—*
Mayet, Jean-Claude, 4,944,828, Cl. 156-397.000.

Compunetics, Inc.: *See—*
Driscoll, John L.; Law, Edward K. H.; Masson, Gerald M.; Coraluppi, Giorgio L.; and Kancel, Michael A., 4,945,534, Cl. 370-62.000.

Concentric Pumps Limited: *See—*
Child, Robin E., 4,944,662, Cl. 418-32.000.

Connell, Wallace J. Book support apparatus. 4,944,413, Cl. 211-42.000.

Conoco Inc.: *See—*
Gessell, Donald E.; and Hosman, Donald P., 4,945,142, Cl. 526-128.000.

Consaga, John P., to United States of America, Navy. Bonding agent for composite propellants. 4,944,815, Cl. 149-19.100.

Cooper Industries, Inc.: *See—*
Marach, David R., 4,944,691, Cl. 439-516.000.

Cooper, Robert P.: *See—*
Hilal, Said S.; and Cooper, Robert P., 4,944,726, Cl. 604-143.000.

CooperVision, Inc.: *See—*
Morland, Albert H.; and Warren, Timothy J., 4,944,899, Cl. 264-1.400.

Coraluppi, Giorgio L.: *See—*
Driscoll, John L.; Law, Edward K. H.; Masson, Gerald M.; Coraluppi, Giorgio L.; and Kancel, Michael A., 4,945,534, Cl. 370-62.000.

Corcoran, Patrick H.: *See—*
Bruylants, Paul P.; Corcoran, Patrick H.; and Simms, John A., 4,945,145, Cl. 526-279.000.

Cordani, John L.; and Letize, Raymond A., to MacDermid, Incorporated. Electrolytic method for regenerating tin or tin-lead alloy stripping compositions. 4,944,851, Cl. 204-106.000.

Cordia, Johannes M.; Evans, Roger W.; and Van Loo, Robert H., to N. V. Raychem S. A. Heat recoverable articles. 4,944,987, Cl. 428-192.000.

Cornelison, Kenneth E.: *See—*
Oglesby, Michael L.; and Cornelison, Kenneth E., 4,944,570, Cl. 350-96.230.

Cornelius Company, The: *See—*
Belland, Terrance G., 4,944,332, Cl. 141-1.000.

Cornell Research Foundation, Inc.: *See—*
Sanford, John C.; Wolf, Edward D.; and Allen, Nelson K., 4,945,050, Cl. 435-172.100.

Cornish, Darrell G.; Mally, Timothy G.; Thiemann, Daniel A.; and Thompson, Bjorn J., to Oscar Mayer Foods Corporation. Reclosable package with encompassing tamper-evident band. 4,944,603, Cl. 383-5.000.

Corrado, James: *See—*
Tuttle, Kenneth A.; and Corrado, James, 4,944,829, Cl. 156-497.000.

Cortina, Manuel: *See—*
Molina, Richard W.; Cortina, Manuel; Bertolina, Roberto; and Balsa, Luis H., 4,944,262, Cl. 123-190.0BD.

Cote, William F.; and Mack, William J., to Eaton Corporation. Method and control system for controlling AMT system including detection of erroneous gear neutral indication. 4,945,484, Cl. 364-424.100.

Cottrell, Ben: *See—*
Jay, Jerry L., Sr.; and Cottrell, Ben, 4,944,868, Cl. 209-10.000.

Couch, Francis O.: *See—*
Schroeder, George L.; Couch, Francis O.; and Saenguraiporn, Chamna, 4,945,533, Cl. 370-32.100.

Coulborn, John W.: *See—*
Dugge, Richard H.; and Coulborn, John W., 4,944,233, Cl. 105-377.000.

Coursen, David D., to Gaylord Container Corporation. Garment box. 4,944,395, Cl. 206-288.000.

Coustre, Andree , to Automobiles Peugeot; and Automobiles Citroen. Electronic device forming a bidirectional interface for controlling a load switching power element. 4,945,297, Cl. 318-558.000.

Covell, Edward H., III. Poultry scalder, scalding system and process. 4,944,068, Cl. 17-11.200.

Cox, James E., Jr., to Cox-Uphoff International Reel. Composite shell material for prosthesis. 4,944,750, Cl. 623-8.000.

Cox, Robert E. L.: *See—*
Labbe, Jean-Marie; Damhuis, Eduard H. J.; and Cox, Robert E. L., 4,944,659, Cl. 417-322.000.

Cox-Uphoff International Reel: *See—*
Cox, James E., Jr., 4,944,750, Cl. 623-8.000.

Crasemann, Jan H., to U.S. Philips Corp. Method of recording binary information in a magneto-optical storage layer, and arrangement for carrying out the method. 4,945,528, Cl. 369-59.000.

Crass, Guenther: *See—*
Stenger, Karl; Strutzel, Hans; and Crass, Guenther, 4,944,970, Cl. 428-34.800.

Crates, James M., to Jameson Corporation. Portable work light with replaceable scuff guard. 4,945,461, Cl. 362-378.000.

Crawfish Technology of South Carolina, Inc.: *See—*
George, Albert L.; and Gooch, Don, 4,944,108, Cl. 43-6.500.

Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S. Automatic beverage dispensing system with plural conveyors. 4,944,337, Cl. 141-174.000.

Cresson, Christian. Vending machine for preparing and delivering hamburgers. 4,944,218, Cl. 99-357.000.

Cronin, John E.; Cronin, Susan F.; Kaanta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., to International Business Machines Corporation. Method of forming borderless contacts. 4,944,682, Cl. 437-192.000.

Cronin, Susan F.: *See—*
Cronin, John E.; Cronin, Susan F.; Kaanta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., 4,944,682, Cl. 437-192.000.

Crosby, Jane M.; and Theberge, John E., to ICI Americas Inc. Methods of improving friction and wear properties of polymer systems. 4,945,126, Cl. 524-507.000.

Crouse, Gary D.; and Webster, Jeffery D., to Eli Lilly and Company. 3-butenamlides. 4,944,795, Cl. 71-98.000.

Crowe, Lawrence E., to Sundstrand Corporation. Hermetically sealed modular electronic cold plate utilizing reflux cooling. 4,944,344, Cl. 165-104.330.

Crozat, Georges, to Faiveley Entreprises; and Societe Nationale Elf Aquitaine. Process for producing cold by solid-gas reaction and device pertaining thereto. 4,944,159, Cl. 62-112.000.

Cuisine Crafts, Inc.: *See—*
Kingsley, I. Steven; and Turback, Victor S., 4,944,957, Cl. 426-643.000.

Cummins-Allison Corp.: *See—*
Raterman, Donald E.; and Muka, John, 4,944,462, Cl. 241-100.000.

Cummins Electronics, Inc.: *See—*
Shea, Patrick R.; and Niemczyk, Robert T., 4,944,260, Cl. 123-179.00H.

Cummins Engine Company, Inc.: *See—*
Perr, Julius P., 4,944,275, Cl. 123-501.000.

Cunningham, Earl A., to International Business Machines Corporation. Magnetic disk recording with variable track width and variable track density. 4,945,427, Cl. 360-75.000.

Curwood, Inc.: *See—*
Buchko, Raymond G., 4,944,442, Cl. 226-171.000.
Busche, David A.; and Bostian, David H., 4,944,409, Cl. 206-632.000.

Cushman, Michael R.; Nicely, Vincent A.; Tennant, Brent A.; and Zoeller, Joseph R., to Eastman Kodak Company. Oxidative secondary rhodium recovery process. 4,945,075, Cl. 502-24.000.

Cyr, Patricia A.: *See—*
Liu, Leland L.; and Cyr, Patricia A., 4,944,990, Cl. 428-353.000.

Czarnecki, Neil A.: *See—*
Leveque, Denis J.; and Czarnecki, Neil A., 4,944,908, Cl. 264-232.000.

D. L. Pryor & Sons, Inc.: *See—*
Pryor, Dewey L.; and Pryor, Charles L., 4,944,366, Cl. 182-141.000.

Daab, Ottfried: *See—*
Knecht, Adolf; Daab, Ottfried; and Weil, Hans-Hermann, 4,944,433, Cl. 222-402.200.

Dabi, Shmuel; and Vassallo, Jayson C., to McNeil-PPC, Inc. In situ crosslinking of polyelectrolytes. 4,944,963, Cl. 427-195.000.

Daifuku Co., Ltd.: *See—*
Maeda, Hajime; and Tsuneda, Masayuki, 4,944,230, Cl. 104-139.000.

Daigre, Jean C., to Societe Dacota (S.A.). Element for slanted desk top rack. 4,944,412, Cl. 211-11.000.

Daikin Industries, Ltd.: *See—*
Ueda, Tomoaki, 4,945,495, Cl. 364-518.000.

Daimler-Benz AG: *See—*
Worner, Gunter; and Tscheplak, Ernst, 4,944,712, Cl. 464-67.000.

Dalferth, Hans, to RUD-Kettenfabrik Rieger; and Dietz GmbH u. Co. Chain conveyor. 4,944,388, Cl. 198-731.000.

Dallas Semiconductor Corporation: *See—*
Bolan, Michael L., 4,945,217, Cl. 235-472.000.

Dalrymple, David C.: *See—*
Ho, S. Winston; Sartori, Guido; Thaler, Warren A.; and Dalrymple, David C., 4,944,880, Cl. 210-640.000.

Daly, C. David; and Khoshnood, Ben, to Thomas & Betts Corporation. Fiber optic receiver and transceiver. 4,945,229, Cl. 250-227.110.

Damhuis, Eduard H. J.: *See—*
Labbe, Jean-Marie; Damhuis, Eduard H. J.; and Cox, Robert E. L., 4,944,659, Cl. 417-322.000.

Damon, Kenneth. Damon syrup recovery system. 4,944,601, Cl. 366-160.000.

Damour, Lawrence R. Expandable roll spindles with integral directional control valve. 4,944,468, Cl. 242-72.00B.

Dan Mamtirim: *See—*
Zakai, Avi, 4,944,456, Cl. 239-222.190.

Danbach, Philip J.; and Sampson, Stephen, to Molex Incorporated. Fiber optic connector assembly. 4,944,568, Cl. 350-96.200.

Danek, Robert J.: *See—*
DeBiasi, Mark S.; Danek, Robert J.; Sailer, Hanns P.; Goldman, Ira B.; and Lesslie, David J., 4,945,443, Cl. 361-93.000.

Dangschat, Rainer, to Siemens Aktiengesellschaft. Switched power pack with protective device for limiting output voltage. 4,945,463, Cl. 363-56.000.

Daniel, Gordon S. Hook and line minder. 4,944,111, Cl. 43-25.200.

Daoud, Adib G.; and Bacher, Fred W., to IVAC Corporation. Clamp for flexible tubing. 4,944,485, Cl. 251-9.000.

da Silva, Jose H.: *See*—
Garcia, Roberto; and da Silva, Jose H., 4,944,769, Cl. 23-293.00S.

Date, Nobuaki; Sunouchi, Akio; Saito, Syuichiro; Murata, Yoshitaka; Ogawa, Yukio; and Tezuka, Nobuo, to Canon Kabushiki Kaisha. Camera shutter and viewfinder control apparatus. 4,945,379, Cl. 354-441.000.

Datlow, David, to J.D.'s. Separator for stored garments. 4,944,417, Cl. 211-184.000.

Davey, Mark A., to Chrysler Corporation. Oil restricting head gasket construction. 4,944,265, Cl. 123-196.00R.

Davis, Donald E.; Ho, Cecil T.; Lieberman, Jon E.; Pfeiffer, Hans C.; and Sturans, Maris A., to International Business Machines Corporation. Tri-deflection electron beam system. 4,945,246, Cl. 250-492.200.

Davis, Gary C.: *See*—
Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
Rich, Jonathan D.; McDermott, Philip J.; Davis, Gary C.; Policastro, Peter P.; Regh, Karen A.; Hernandez, Pamela K.; and Guggenheim, Thomas L., 4,945,148, Cl. 528-26.000.

Davis, Howard, to Slingshot Corporation. Expandable outsole. 4,944,099, Cl. 36-97.000.

Davis, Lindsey B., Jr. Method for molding concrete blocks or bricks. 4,944,907, Cl. 264-220.000.

Davoust, Marie-Eve: *See*—
Moisan, Monique; Pavy, Dominique; Davoust, Marie-Eve; Saada, Serge; and Chollet, Patrick, 4,944,244, Cl. 118-723.000.

Davy McKee (London) Limited: *See*—
Wood, Michael A., 4,945,173, Cl. 549-295.000.

Day, Richard A., to University of Cincinnati. Formation of lactams and other amides under mild conditions by action of cyanogen. 4,945,159, Cl. 540-215.000.

Dayton, David W.: *See*—
Schroeder, Roger A.; Broyden, Robert H.; Dearstyne, Robert C.; Magner, Joseph L.; Gephart, Randall J.; Dayton, David W.; and Newman, Raymond A., 4,944,056, Cl. 5-81.00R.

de Almeida Lamprecht, Antonio R.: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

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Dearstyne, Robert C.: *See*—
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Deaville, David C., to Mars Incorporated. Telephone set. 4,945,558, Cl. 379-144.000.

DeBiasi, Mark S.; Danek, Robert J.; Sailer, Hanns P.; Goldman, Ira B.; and Lesslie, David J., to General Electric Company. Electronic circuit interrupter with combined keypad and display. 4,945,443, Cl. 361-93.000.

De Bondt, Guy L. P.: *See*—
Marinus, Antonius A. M.; Miermans, Hubertus C.; and De Bondt, Guy L. P., 4,945,465, Cl. 363-89.000.

DeChristopher, Eugene L. Apparatus with roller for kneading a proofed ball of dough. 4,944,596, Cl. 366-69.000.

Deckard, Carl R.: *See*—
Bourell, David L.; Marcus, Harris L.; Barlow, Joel W.; Beaman, Joseph J.; and Deckard, Carl R., 4,944,817, Cl. 156-62.200.

Deeb, Thomas M.; Henry, George K.; and Bergmann, Heather L., to Du Pont de Nemours, E. I., and Company. Compositions and process of using in refrigeration. 4,944,890, Cl. 252-54.000.

Deering, Michael F., to Schlumberger Technologies, Inc. Triangle processor for 3-D graphics display system. 4,945,500, Cl. 364-522.000.

Degenhart, Thomas W.: *See*—
Kinney, John W.; Rubasch, Anthony P.; and Degenhart, Thomas W., 4,945,328, Cl. 335-202.000.

De Groot, Franciscus J.; De Swart, Jan W.; and Boerhoop, Jan, to Handelsvennootschap onder de firma Stengelbengel B.V. Device for cutting the stalk of a flower or plant. 4,944,092, Cl. 30-134.000.

Deguchi, Naoyasu; and Ohno, Shigeru, to Fuji Photo Film Co., Ltd. Direct positive photographic materials. 4,945,033, Cl. 430-522.000.

Degussa Aktiengesellschaft: *See*—
Effenberger, Franz; and Steegmuller, Dieter, 4,945,168, Cl. 548-454.000.

Deheuvels, Jean-Paul: *See*—
Ratkoff, Georges; and Deheuvels, Jean-Paul, 4,944,297, Cl. 128-399.000.

DeKarske, Clarence W.; and Peterson, Aaron C., to Unisys Corporation. High-speed partitioned set associative cache memory. 4,945,512, Cl. 365-49.000.

Delaware Capital Formation Inc.: *See*—
Evans, Alfred J., 4,944,172, Cl. 72-53.000.

Delsol, Gilbert: *See*—
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DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, to Hoechst Celanese Corp. Side chain liquid crystalline polymers exhibiting nonlinear optical response. 4,944,896, Cl. 252-587.000.

Demura, Motokuni: *See*—
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Den Norske Stats Oljeselskap A.S.: *See*—
Mylvaganam, Kanagasabe; and Hammer, Erling, 4,945,276, Cl. 310-326.000.

Denison, William W., to Telex Communications. Color graphic imager utilizing a liquid crystal display. 4,944,578, Cl. 350-347.00E.

Depiano, Joseph G.; and Schmidt, Linda S. Picture frame leveling tool. 4,944,094, Cl. 33-371.000.

Desai, Jay S., to Becton, Dickinson and Company. Sterilization of blood component separation devices. 4,944,918, Cl. 422-22.000.

Desitin Arzneimittel GmbH: *See*—
Schafer, Helmut, 4,945,180, Cl. 562-599.000.

DesLauriers, Paul J.; and Heilman, William J., to Pennzoil Products Company. Rust conversion composition. 4,945,017, Cl. 524-111.000.

DeSoto, Inc.: *See*—
Murphy, Edward J.; Ansel, Robert E.; and Krajewski, John J., 4,945,032, Cl. 430-394.000.

Dessauer, Rolf: *See*—
Kempf, Richard J.; Dessauer, Rolf; and Freilich, Steven C., 4,945,020, Cl. 430-49.000.

Destephano, Joseph P.: *See*—
Bassa, Ivette A.; Destephano, Joseph P.; Katcher, Jay H.; and Schara, Robert E., 4,944,955, Cl. 426-579.000.

De Swart, Jan W.: *See*—
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Deutsche Voest-Alpine Industrieanlagenbau GmbH: *See*—
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DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, to American Cyanamid Company. Antidiabetic phosphonates. 4,945,158, Cl. 536-117.000.

De Vroome, Clemens J. M.: *See*—
Jacobs, Thomas G. M.; and De Vroome, Clemens J. M., 4,944,673, Cl. 432-59.000.

DeWan, Thomas E. Article with container-forming portion. 4,944,042, Cl. 2-94.000.

Dexter Corporation: *See*—
Aleckner, John F., Jr.; Cherry, David J.; and Spencer, Lee R., Jr., 4,945,005, Cl. 428-500.000.

Dhein, Rolf: *See*—
Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, 4,945,137, Cl. 525-375.000.

Dial, John H. Fastener tester. 4,944,188, Cl. 73-761.000.

Diana, Guy D., to Sterling Drug Inc. 1,3,4-Oxadiazolyl-phenoxyalkylisoxazoles and their use as antiviral agents and intermediates thereof. 4,945,164, Cl. 548-247.000.

Dias, Edson d.: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

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Dick, Helmut; Gradel, Wolf-Dietrich; and Weber, Mathias, to Boehringer Mannheim GmbH. Method for resolution of racemic thiamphenicol precursors and intermediates therefor. 4,945,181, Cl. 564-212.000.

Dick, Scott W. Vehicle accessory storage device. 4,944,544, Cl. 296-37.100.

Dicke, Hans-Rudolf: *See*—
Genz, Joachim; Dicke, Hans-Rudolf; Grigo, Ulrich; and Nouvertne, Werner, 4,945,130, Cl. 525-67.000.

Didiergeorge, Pierre, to Schlumberger Industries, S.A. System for issuing tickets. 4,945,213, Cl. 235-31.00T.

Diehl GmbH & Co.: *See*—
Fiedler, Kurt; Kratz, Bernhard; Kordel, Gerhard; and Scheiderer, Gerrit, 4,944,224, Cl. 102-202.200.

Diesel Kiki Co., Ltd.: *See*—
Tanoue, Akifumi; Kono, Hiromi; and Satoh, Yuji, 4,944,194, Cl. 74-335.000.

Dietrich, Ursula. Protective mask. 4,944,039, Cl. 2-13.000.

Dietz GmbH u. Co.: *See*—
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DiFlora, Joseph E.: *See*—
Mawhirt, James A.; DiFlora, Joseph E.; McCandless, William J. C.; and Ward, George H., 4,944,924, Cl. 422-104.000.

Digital Equipment Corporation: *See*—
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Di Guiseppi, James L.: *See*—
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Dillingham, Harold W. Device for dispensing asphalt repair materials. 4,944,632, Cl. 404-111.000.

Dillon, Joseph A.; and Dillon, Mark E., to Tetratec Corporation. Process of producing a fibrillated semi-interpenetrating polymer network of polytetrafluoroethylene and silicone elastomer and shaped products thereof. 4,945,125, Cl. 527-427.000.

Dillon, Mark E.: *See*—
Dillon, Joseph A.; and Dillon, Mark E., 4,945,125, Cl. 527-427.000.

Dion, John H., to Hewlett-Packard Company. Tape automated bonded (tab) circuit and method for making the same. 4,944,850, Cl. 204-15.000.

Dirks, Patrick W.: *See*—
Bruffey, Bill M.; Sidhu, Gursharan S.; Dirks, Patrick W.; and McFall, Christopher R., 4,945,475, Cl. 364-200.000.

Distefano, Salvador: *See*—
Bugga, Ratnakumar V.; Distefano, Salvador; Nagasubramanian, Ganesan; and Bankston, Clyde P., 4,945,012, Cl. 429-103.000.

Ditzig, Albert: *See*—
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Divasalar, Dariush: *See*—
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Dixon International Limited: *See*—
Milner, Bruce A.; Malcolm-Brown, Tessa; and Southern, Eric, 4,945,015, Cl. 523-179.000.

Doan, Phong D.; Cobian, Kenneth E.; Upton, James E.; and Haeg, Daniel C., to Medtronic, Inc. Ring electrode for multiconductor pacing leads. 4,944,088, Cl. 29-858.000.

Dobbelstein, Arnold: *See*—
Hille, Hans-Dieter; Muller, Horst; and Dobbelstein, Arnold, 4,945,128, Cl. 524-591.000.

Dobreff, Susanne: *See*—
Grabley, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, 4,945,108, Cl. 514-475.000.

Dock Leveler Manufacturing, Inc.: *See*—
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Dr. Ing. Rudolf Hell GmbH: *See*—
Kalstroem, Reiner; and Schulz-DuBois, Erich, 4,944,593, Cl. 356-379.000.

Doddrell, David M.; and Brooks, William M., to University of Queensland. Volume selected NMR spectroscopy. 4,945,308, Cl. 324-309.000.

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Doman, Trevor D.; Buttery, John R.; and Gould, Royston M. Vehicle and method of releasably coupling parts of the vehicle together. 4,944,359, Cl. 180-208.000.

Dombeck, John A.: *See*—
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Dommer, Armin; and Dommer, Dieter. Apparatus having two adjustable slide supports which have attachment surfaces for attaching two holding devices. 4,944,626, Cl. 403-3.000.

Dommer, Dieter: *See*—
Dommer, Armin; and Dommer, Dieter, 4,944,626, Cl. 403-3.000.

Donaghey, Richard L. Guidance system for a self-propelled machine. 4,944,140, Cl. 56-10.200.

Donnelly, Robert H.: *See*—
Sundholm, Patrick J.; Donnelly, Robert H.; and Kangas, Martti Y. O., 4,944,960, Cl. 427-27.000.

Dorman, Douglas M. Automotive fuse connector. 4,944,697, Cl. 439-621.000.

Dorn, Kevin L. Electric cord take-up device. 4,944,694, Cl. 439-501.000.

Dorr, John A., to Xecutek Corporation. Ultrasonic measuring system. 4,944,186, Cl. 73-597.000.

Dorsch, Norman, to Wacker-Chemie GmbH. Compositions which crosslink in the presence of moisture at room temperature to form elastomers. 4,944,989, Cl. 428-319.700.

Dotsch, Lorenz: *See*—
Grabner, Bernd; Dotsch, Lorenz; Knauder, Josef; and Hoffgen, Hans, 4,944,497, Cl. 266-268.000.

Doughty, Dennis J.; Seymour, Raymound K.; and Maulandi, Aymon A., to General Electric Company. Molded case circuit breaker variable arc exhaust shield. 4,945,327, Cl. 335-201.000.

Dow Chemical Company, The: *See*—
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Dubensky, Ellen M.; and Timm, Edward E., 4,945,073, Cl. 501-93.000.
Hefner, Robert E., Jr.; and Robinson, John W., 4,945,138, Cl. 525-502.000.
Marshall, William B.; Pribish, James R.; and Brewbaker, James L., 4,945,150, Cl. 528-193.000.
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; Brewster, Steven L.; and Higgins, George C., 4,944,999, Cl. 428-371.000.
Pawloski, Chester E.; Fielding, Donna J.; and Wampfler, David J., 4,945,118, Cl. 521-107.000.
Pennington, Donald W.; and Allison, Joseph L., 4,945,133, Cl. 525-261.000.
Smits, Guide F.; and Grunbauer, Henri J. M., 4,945,119, Cl. 521-131.000.
Tou, James C.; and Rulf, Donald C., 4,944,180, Cl. 73-38.000.
Wallace, Karen L.; and Lee, Dolk, 4,945,134, Cl. 525-301.000.
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Dow Corning Corporation: *See*—
Burns, Gary T.; and Zank, Gregg A., 4,945,072, Cl. 501-88.000.

Downs, Thomas R.: *See*—
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Drakeley, Brian K.: *See*—
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Drent, Eit, to Shell Oil Company. Process for the preparation of esters of carboxylic acids and catalytic system for use therein. 4,945,179, Cl. 560-233.000.

Driscoll, John L.; Law, Edward K. H.; Masson, Gerald M.; Coraluppi, Giorgio L.; and Kancel, Michael A., to Compunetics, Inc. Programmable conferencing module for ring arrays and switchable ring array networks. 4,945,534, Cl. 370-62.000.

Driscoll, Richard C.: *See*—
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Drobny, Wolfgang: *See*—
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Droste, Heinz: *See*—
Bunse, Wolfgang; Ernst, Hans-Otto; Droste, Heinz; Kalze, Franz-Josef; and Peitz, Wolfgang, 4,945,454, Cl. 362-61.000.

Drown, Donald L.; Runge, Richard O.; and Brumenshenkel, Elmer L., to Versa Cap, Inc. Telescoping type cover for truck beds and the like. 4,944,550, Cl. 296-100.000.

Dryden, Hugh L., Jr.: *See*—
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Dubensky, Ellen M.; and Timm, Edward E., to Dow Chemical Company, The. High hardness, wear resistant materials. 4,945,073, Cl. 501-93.000.

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Duderstadt, J. Christopher. Lift truck having improved single mast and bearing wheel assembly. 4,944,368, Cl. 187-9.00R.

Dufournet, Denis: *See*—
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Thuries, Edmond; Dufournet, Denis; and Perret, Michel, 4,945,198, Cl. 200-148.00A.

Dugge, Richard H.; and Coulborn, John W., to ACF Industries, Incorporated. Hatch arrangement for covered hopper cars. 4,944,233, Cl. 105-377.000.

Dunbobbin, Brian R.; Carlin, Richard T.; and Cassano, Anthony A., to Air Products and Chemicals, Inc. High temperature oxygen recovery with reversible chemical reaction. 4,944,934, Cl. 423-579.000.

Du Pont de Nemours, E. I., and Company: *See*—
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Carson, David M., 4,944,721, Cl. 494-16.000.
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Goodley, George R.; and Taylor, Harold J., 4,945,151, Cl. 528-272.000.
Gupta, Dipak, 4,944,824, Cl. 156-286.000.
Hayes, Richard A., 4,944,775, Cl. 55-16.000.
Kempf, Richard J.; Dessauer, Rolf; and Freilich, Steven C., 4,945,020, Cl. 430-49.000.
Manzer, Leo E.; Rao, V. N. Mallikarjuna; Rockwell, Richard T.; Sisk, Michael A.; Warwas, Edwin J.; and Winteringham, Roy, 4,944,846, Cl. 203-1.000.
Moran, Edward F., Jr., 4,945,183, Cl. 568-309.000.
Rightmyre, Bruce M., 4,944,586, Cl. 353-108.000.
Sheer, M. Lana, 4,944,975, Cl. 428-36.100.

Dupont, Pierre: *See*—
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Durairaj, Bojayan, to Indspec Chemical Corporation. Novel bis-maleimide compounds containing sulfonate linkages. 4,945,169, Cl. 548-521.000.

Duret, Pierre, to Institut Francais du Petrole. Two-stroke engine with pneumatic injection and flowrate restriction at the exhaust. 4,944,255, Cl. 123-65.0EM.

Durina, Michael F.: *See*—
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Durney/Alexander: *See*—
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Durney, Max W., to Durney/Alexander, a part interest. Apparatus and method for joining workpieces. 4,944,627, Cl. 403-8.000.

Duval, Eugene F.: *See*—
Yurchenco, James R.; and Duval, Eugene F., 4,944,481, Cl. 248-372.100.

Dybsky, John M.; Erswell, George A., Jr.; Silvestri, John L.; Loser, Karl H.; and McDonald, Craig A. Composite roofing substrate panel. 4,944,818, Cl. 156-71.000.

Dyer, Henry B.: *See*—
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Dykes, Robert M.: *See*—
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Dynamic Air Inc.: *See*—
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Dynamic Research and Development Corp.: *See*—
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Dynamit Nobel Aktengesellschaft: *See*—
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Dynasplint Systems, Inc.: *See*—
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E. Bruderer Maschinenfabrik AG: *See*—
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E. D. R. Industries, Inc.: *See*—
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E-Z-EM, Inc.: *See—*
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Eastman Kodak Company: *See—*
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Cushman, Michael R.; Nicely, Vincent A.; Tennant, Brent A.; and Zoeller, Joseph R., 4,945,075, Cl. 502-24.000.
Fagerburg, David R.; Rule, Mark; Watkins, Joseph J.; and Lawrence, Paul B., 4,945,155, Cl. 528-480.000.
Gehret, Jon F., 4,945,285, Cl. 313-278.000.
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Kwon, Heemin; and Liang, Jeanine T., 4,945,502, Cl. 364-574.000.
McCombs, Charles A., 4,945,178, Cl. 560-125.000.
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Eaton Corporation: *See—*
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Cote, William F.; and Mack, William J., 4,945,484, Cl. 364-424.100.
Leveque, Denis J.; and Czarnecki, Neil A., 4,944,908, Cl. 264-232.000.
Mahon, Joseph J.; and Aigner, Robert K., 4,945,196, Cl. 200-38.00C.
Malone, Peter J.; Thompson, Michael B.; Torrence, Robert J.; and Gaudette, Marvin F., 4,944,160, Cl. 62-180.000.
Stine, Alan C.; and Reynolds, Joseph D., 4,944,197, Cl. 74-477.000.
Woodard, Steven W., 4,944,278, Cl. 123-559.100.
Woodard, Steven W., 4,944,279, Cl. 123-559.100.
Eberling, Charles E., to Allied-Signal Inc. Air suspension system with load controlled liftable axle. 4,944,526, Cl. 280-704.000.
Ebert, William S.: *See—*
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Eckardt, Helmut; Ehritt, Jurgen; Bockenheimer, Alexander; and Teschner, Rainer, to Battenfeld GmbH. Method for manufacturing multilayer molded articles. 4,944,909, Cl. 264-255.000.
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Edmiston, Robert A.: *See—*
Waite, Diana H.; Chance, Nathan H., Jr.; and Edmiston, Robert A., 4,944,320, Cl. 134-167.00C.
Edmond, John A.: *See—*
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Edmonds Medical Systems, Inc.: *See—*
Keller, Jeff; and Linton, Robert, 4,944,506, Cl. 272-69.000.
Edwards, Bill R. Acrylic resin composition. 4,945,122, Cl. 524-166.000.
Edwards, D. Craig, to First Medic. Medical information system. 4,945,477, Cl. 364-413.060.
Edwards, M. Earl; and May, James G., to Astec Industries, Inc. Highway transportable material storage apparatus and frame assembly therefor. 4,944,646, Cl. 414-332.000.
Effenberger, Franz; and Steegmuller, Dieter, to Degussa Aktiengesellschaft. Method of preparing aryl-(1-phthalimido)-alkyl ketones. 4,945,168, Cl. 548-454.000.
Efstratis, Ernest. Easy glide fun ride. 4,944,507, Cl. 272-85.000.
Egan, Walter G., to Grumman Aerospace Corporation. Detection system for circularly polarized radiation. 4,944,579, Cl. 350-396.000.
Egashira, Yoshimi, to Harada Kogyo Kabushiki Kaisha. Automobile antenna attachment device. 4,945,361, Cl. 343-715.000.
Egli AG: *See—*
Egli, Urs, 4,944,631, Cl. 404-91.000.
Egli, Urs, to Egli AG. Machine for redeveloping the constructional layers of roads. 4,944,631, Cl. 404-91.000.
Ehritt, Jurgen: *See—*
Eckardt, Helmut; Ehritt, Jurgen; Bockenheimer, Alexander; and Teschner, Rainer, 4,944,909, Cl. 264-255.000.
Eickhoff, Robert D.: *See—*
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Ejiri, Akira, to Seiko Instruments Inc. Active matrix display device of the nonlinear two-terminal type. 4,945,352, Cl. 340-805.000.
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Elberbaum, David, 4,945,417, Cl. 358-210.000.
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Kay, William M.; and Elder, Bruce E., 4,944,076, Cl. 27-14.000.
Eldridge, John D., Jr.; and Morgan, Mary A., to Jodel Medical Products, Inc. Surgical instrument retainer. 4,944,311, Cl. 128-849.000.
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Karas, Bradley R.; and Powers, Robert W., 4,944,991, Cl. 428-408.000.
Electro Optic Systems Pty. Ltd.: *See—*
Greene, Benny A., 4,945,547, Cl. 372-94.000.
Electrothermal Engineering: *See—*
Brooks, John F.; and Farnese, Paul L., 4,945,211, Cl. 219-385.000.
Elektro-Apparatebau Olten AG: *See—*
Berger, Fritz, 4,945,194, Cl. 200-5.00R.
Eli Lilly and Company: *See—*
Bollinger, Nancy G.; Goodson, Theodore, Jr.; and Herron, David K., 4,945,099, Cl. 514-381.000.
Crouse, Gary D.; and Webster, Jeffery D., 4,944,795, Cl. 71-98.000.
Lindstrom, Terry D.; and Whitaker, Gary W., 4,945,080, Cl. 514-29.000.
Eliassen, Carlo: *See—*
Linga, Hogne; and Eliassen, Carlo, 4,944,672, Cl. 432-3.000.
Eliasson, Baldur; and Kogelschatz, Ulrich, to BBC Brown Boveri AG. High-power radiator. 4,945,290, Cl. 315-246.000.
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Kulishev, Boris V.; Petlakh, Yakov M.; and Elizarov, Boris V., 4,944,067, Cl. 17-11.000.
Elliott, Linda C.; Horn, Gary R.; Jordan, Lloyd E., II; Levine, Frank E.; Shih, Cheng-Fong; and Myre, William W., Jr., to International Business Machines Corporation. Method for restoring a database after I/O error employing write-ahead logging protocols. 4,945,474, Cl. 364-200.000.
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Bodick, Neil; and Marquis, Andre L., 4,945,476, Cl. 364-413.020.
Elsner, Ernst, to J. M. Voith GmbH. Safety coupling. 4,944,377, Cl. 192-56.00F.
Eltro GmbH: *See—*
Kohler, Ludwig, 4,944,588, Cl. 356-152.000.
Embal-Systems: *See—*
Coalier, Guy; and Serre, Jean-Claude, 4,945,007, Cl. 428-542.800.
Emhart Industries, Inc.: *See—*
Fayngersh, Zakhary; Slusarski, Ronald S.; and Schumacher, Richard W., 4,944,066, Cl. 16-49.000.
Nebelung, Hermann H.; and Ruschau, Walter, 4,944,207, Cl. 83-162.000.
Emitec Gesellschaft fur Emissionstechnologie mbH: *See—*
Swars, Helmut, 4,944,173, Cl. 72-62.000.
Endo, Fumio: *See—*
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, 4,945,335, Cl. 340-426.000.
Endo, Junji: *See—*
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Endo, Kinichi: *See—*
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Endo, Yoshishige: *See—*
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Engel, Wolf D.: *See—*
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Kaufman, Arthur; and Werth, John, 4,945,010, Cl. 429-26.000.
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Enichem Anic S.p.A.: *See—*
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Lawson, John A., 4,945,287, Cl. 250-236.000.
EPE Incorporated: *See—*
Strop, Hans R.; and Perry, Richard R., 4,944,954, Cl. 426-417.000.
Erekson, Erek J.; Lee, Anthony L.; Barone, S. Peter; and Solomon, Irvine J., to Institute of Gas Technology. Mixed basic metal sulfide catalyst. 4,945,078, Cl. 502-202.000.
Erickson, Robert: *See—*
Hill, John B.; Dryden, Hugh L., Jr.; and Erickson, Robert, 4,945,172, Cl. 549-253.000.
Eriksen, Erik P. V.; Drakeley, Brian K.; and Carmody, Michael A., to Baker Hughes Incorporated. Downhole safety valve for subterranean well and method. 4,944,351, Cl. 166-376.000.
Eriksson, Kjell-Anders. Barking method, and an apparatus for utilization of the method. 4,944,338, Cl. 144-208.00E.
Ernst, Hans-Otto: *See—*
Busse, Wolfgang; Ernst, Hans-Otto; Droste, Heinz; Kalze, Franz-Josef; and Peitz, Wolfgang, 4,945,454, Cl. 362-61.000.
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Eschenfelder, Volker; Schmied, Bernhard; and Ruebsamen, Klaus, to BASF Aktiengesellschaft. Mixture of a substance having thrombolytic activity and of an antithrombotic substance. 4,944,943, Cl. 424-94.640.
Essef: *See—*
Frederick, Stanley H., 4,944,887, Cl. 210-778.000.
Etablissement Public de Diffusion dit "Telediffusion de France" : *See—*
Christian, Victorion; and Jacques, Guionnet, 4,945,564, Cl. 380-14.000.
Estrada, Julio R., to National Semiconductor Corporation. TTL to ECL/CML translator circuit with differential output. 4,945,263, Cl. 307-475.000.

Estrada, Julio R., to National Semiconductor Corporation. ECL/CML pseudo-rail circuit, cutoff driver circuit, and latch circuit. 4,945,265, Cl. 307-455.000.

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Moisan, Monique; Pavy, Dominique; Davoust, Marie-Eve; Saada, Serge; and Chollet, Patrick, 4,944,244, Cl. 118-723.000.

Ethyl Corporation: *See*—
Kolich, Charles H.; Klobucar, W. Dirk; and Books, Jeffrey T., 4,945,139, Cl. 525-538.000.
Kolich, Charles H.; and Klobucar, W. Dirk, 4,945,140, Cl. 525-538.000.
Lanier, Carroll W.; and Lee, Raymond, 4,944,902, Cl. 264-25.000.

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Kolaska, Hans; and Ettmayer, Peter, 4,944,800, Cl. 75-238.000.

Evans, Alfred J., to Delaware Capital Formation Inc. Method of making a U-shaped closure tamper evident. 4,944,172, Cl. 72-53.000.

Evans, Roger W.: *See*—
Cordia, Johannes M.; Evans, Roger W.; and Van Loo, Robert H., 4,944,987, Cl. 428-192.000.

Ewert, Charles, to Unipatent Holding S.A. Compensator for hand-held firearms. 4,944,213, Cl. 89-14.300.

Extermination Systems, Inc.: *See*—
Sims, Gregory A., 4,944,110, Cl. 43-124.000.

Extrel FTMS, Inc.: *See*—
Goodman, Seth; and Hanna, Alan, 4,945,234, Cl. 250-291.000.

Exxon Research and Engineering Company: *See*—
Ho, S. Winston; Sartori, Guido; Thaler, Warren A.; and Dalrymple, David C., 4,944,880, Cl. 210-640.000.
Kugler, Edwin L., 4,944,864, Cl. 208-120.000.
Madden, Patrick C., II; and Foroulis, Z. Andrew, 4,944,917, Cl. 422-13.000.

Ezuz, Shabtai: *See*—
Landa, Benzion; Ezuz, Shabtai; Shmaiser, Aron; Pinhas, Hanna; and Lior, Ishaiau, 4,945,387, Cl. 355-271.000.

Faccin, Andrea: *See*—
Mistrorigo, Mario; Barcaro, Massimo; and Faccin, Andrea, 4,944,931, Cl. 423-386.000.

FAG Kugelfischer Georg Schafer (KGaA): *See*—
Ankenbauer, Gerhard; and Hofmann, Heinrich, 4,944,611, Cl. 384-476.000.

Fagerburg, David R.; Rule, Mark; Watkins, Joseph J.; and Lawrence, Paul B., to Eastman Kodak Company. Preparation of low color copoly(arylene sulfide) by heating copoly(arylene sulfide). 4,945,155, Cl. 528-480.000.

Faiveley Entreprises: *See*—
Crozat, Georges, 4,944,159, Cl. 62-112.000.

Falk, Ernst, to Richard Wolf GmbH. Forceps with shearing jaws. 4,944,093, Cl. 30-251.000.

Fantone, Stephen D.: *See*—
Bowen, Mark S.; Fantone, Stephen D.; and Miller, Bruce E., 4,945,250, Cl. 250-461.100.

Fanuc Ltd.: *See*—
Arai, Takeji, 4,945,206, Cl. 219-121.740.
Arai, Takeji, 4,945,207, Cl. 219-121.840.
Fujioka, Yoshiki, 4,945,190, Cl. 174-68.500.

Fanuc Ltd: *See*—
Kurakake, Mitsuo; Otsuka, Shoichi; and Muraoka, Yutaka, 4,945,496, Cl. 364-518.000.

Farnese, Paul L.: *See*—
Brooks, John F.; and Farnese, Paul L., 4,945,211, Cl. 219-385.000.

Farnsworth, Thomas L., to Invequest, Inc. Carbon paper shredder. 4,944,461, Cl. 241-36.000.

Farr, John F., to United States of America, Army. Hydroactivated bionic infrared source. 4,945,248, Cl. 250-493.100.

Farrell, Jonathon E.; and Anthony, Mark C. Fluid flow sensor having light reflective slider. 4,945,344, Cl. 340-610.000.

Fartmann, Norbert: *See*—
Langen, Hans; Fartmann, Norbert; and Coenen, Herbert, 4,944,354, Cl. 172-47.000.

Fatouros, Panos P.: *See*—
Wist, Abund O.; Pandey, Ramendra N.; and Fatouros, Panos P., 4,945,239, Cl. 250-358.100.

Faulmann, Ervin: *See*—
Boyle, Michael D. P.; and Faulmann, Ervin, 4,945,157, Cl. 530-409.000.

Fawn Engineering Corp.: *See*—
Albright, Henry J., 4,944,414, Cl. 211-59.200.

Fayngersh, Zakhary; Slusarski, Ronald S.; and Schumacher, Richard W., to Emhart Industries, Inc. Adjustable closer arm. 4,944,066, Cl. 16-49.000.

Feeman, James F.: *See*—
Hammond, Peter R.; and Feeman, James F., 4,945,176, Cl. 549-227.000.

Felix Schoeller Jr. GmbH & Co. KG: *See*—
Jerenz, Hans, 4,944,966, Cl. 427-397.000.

Fellingham, George H.: *See*—
Pastrone, John; Fellingham, George H.; and Lawless, Michael, 4,944,191, Cl. 73-599.000.

Felton, Clinton D.; Gibson, Baylor D.; Jamison, Charles E.; McWhorter, William O.; and Serad, George A., to Celanese Corporation. Electret process and products. 4,944,854, Cl. 204-168.000.

Feng, Ou-Yang; and Ho, Ou-Yang C. Telescopic rod means having rotatably retractable display sheet. 4,944,656, Cl. 116-173.000.

Fenton, Richard J.: *See*—
Murphy, Kenneth S.; Hendricks, Robert E.; and Fenton, Richard J., 4,944,858, Cl. 204-192.150.

Feros, Paul, to Service National Electricite de France. Device for monitoring the unbalance of the electric power demanded. 4,945,304, Cl. 324-107.000.

Ferren, Bran; Harrison, Charles F.; Hope, Clinton B.; and Kohut, Robert J. Two-axis beam steering system for use in automated light fixtures. 4,945,459, Cl. 362-284.000.

Ferris, John R.: *See*—
Chagnon, Mark S.; and Ferris, John R., 4,944,802, Cl. 106-20.000.

Ferruti, Paolo: *See*—
Barbucci, Rolando; Ferruti, Paolo; Grossi, Adalberto; and Lenm, Wilfried G., 4,944,767, Cl. 623-66.000.

Fetter, Richard W.: *See*—
Kabachinski, Jeffery L.; and Fetter, Richard W., 4,945,318, Cl. 333-12.000.

Fetterly, Richard, to Fulton Boiler Works, Inc. Condensate return tanks. 4,944,251, Cl. 122-451.00R.

Fiberglass Canada Inc.: *See*—
Meunier, Paul J.; Lunt, James; and MacPherson, Edwin J., 4,945,077, Cl. 502-168.000.

Fiedler, Kurt; Kratz, Bernhard; Kordel, Gerhard; and Scheiderer, Gerrit, to Diehl GmbH & Co.; and Dynamit Nobel Aktengesellschaft. Electrical igniting medium. 4,944,224, Cl. 102-202.200.

Field, Michael E.: *See*—
Lilly, Norman R.; Marin, M. James; and Field, Michael E., 4,944,827, Cl. 156-384.000.

Fielding, Donna J.: *See*—
Pawloski, Chester E.; Fielding, Donna J.; and Wampfler, David J., 4,945,118, Cl. 521-107.000.

Fielding, Robert M.: *See*—
Uster, Paul S.; Fielding, Robert M.; and Martin, Francis J., 4,944,948, Cl. 424-450.000.

Fikentscher, Rolf: *See*—
Baus, Ulf; Reuther, Wolfgang; and Fikentscher, Rolf, 4,945,166, Cl. 548-369.600.

Filho, Jorge H.: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

Fingerson, Conrad F.; Nelson, Bruce A.; Carlson, Dennis L.; and Eickhoff, Robert D., to AFC, Inc. Arrow shaft end adaptor apparatus and balance pin apparatus and method. 4,944,520, Cl. 273-419.000.

Finnegan, Patrick J. Apparatus for forming horse shoes. 4,944,147, Cl. 59-56.000.

Fiorda, John H. Film magazine for underwater cameras. 4,945,369, Cl. 354-173.100.

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Fisher, Paul J.: *See*—
Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., 4,944,574, Cl. 350-245.000.

Fishman, Lawrence R. Stringed instrument piezoelectric transducer. 4,944,209, Cl. 84-731.000.

Flamig, Hans; Schutte, Andreas; Schiel, Christian; Steiner, Karl; and Mullner, Josef, to J. M. Voith GmbH. Mounting a press shell to a press roll for dewatering a web. 4,944,089, Cl. 29-895.220.

Flanagan, Thomas P., to National Starch and Investment Holding Corporation. Toughened hot melt adhesive composition for book casemaking. 4,944,994, Cl. 428-290.000.

Fless, Gunther M.; and Scanu, Angelo M., to Arch Development Corporation. Immunoassay for lipoprotein(a). 4,945,040, Cl. 435-7.000.

Fletcher, Gilbert K. Valved seed outlet. 4,944,637, Cl. 406-132.000.

Flock, Thomas G.; and Baysinger, Scott D., to Hughes Aircraft Company. Missile launcher. 4,944,210, Cl. 89-1.818.

Flores, Pamela A.: *See*—
Griesbaum, Theodore J.; Lydic-Mettler, Joan S.; Flores, Pamela A.; Jasek, Anthony B.; and Wrzesinski-Conran, Mary A., 4,944,556, Cl. 297-437.000.

Floyd, Middleton B., Jr.: *See*—
DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,945,158, Cl. 536-117.000.

Fluck, Peter: *See*—
Hennequin, James R.; and Fluck, Peter, 4,944,755, Cl. 623-19.000.

Flynn, Michael J.: *See*—
Story, Michael J.; and Flynn, Michael J., 4,944,949, Cl. 424-451.000.

Flynn, William K. Golf swing practice and exercise apparatus. 4,944,518, Cl. 273-186.00A.

FMC Corporation: *See*—
Orlando, Franklin P.; Butler, Lee D.; Luttrell, Donald A.; and Goulart, Joseph S., 4,944,141, Cl. 56-17.100.
Riley, Terry M., 4,944,381, Cl. 198-370.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz, 4,944,315, Cl. 131-283.000.

Focke, Heinz, to Focke & Co. (GmbH & Co.). Apparatus for the production and packaging of cigarettes. 4,944,315, Cl. 131-283.000.

Follette, Martha G., to Raychem Corporation. Wraparound article. 4,944,973, Cl. 428-36.100.

Fong Yang Plastic Co., Ltd.: *See*—
Wu, Shui-Kuan, 4,944,402, Cl. 206-581.000.

Fontecchio, Robert P.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; Good, Stanley B.; and Hendrix, Troy C., 4,944,527, Cl. 280-741.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Compartmented flanged tray. 4,944,451, Cl. 229-120.170.
Ford Motor Company: *See*—
Achenbach, Kurt F., 4,944,524, Cl. 280-701.000.
Huang, Bernard; and Milenkovic, Veljko, 4,945,493, Cl. 364-513.000.
Mansoor, Dhafer Y.; and Pohto, Arnold O., 4,944,540, Cl. 293-115.000.
Oslapas, Algis, 4,944,356, Cl. 180-79.100.
Ford, Thomas J. Hydro-acoustic device for warning sea mammals. 4,945,520, Cl. 367-191.000.
Foroulis, Z. Andrew: *See*—
Madden, Patrick C., II; and Foroulis, Z. Andrew, 4,944,917, Cl. 422-13.000.
Forrest, Gordon C.; Rattle, Simon J.; Robinson, Grenville A.; and Hill, Hugh A. O., to Serono Diagnostics Ltd. Electrochemical methods of assay. 4,945,045, Cl. 435-25.000.
Fort Wayne Wire Die, Inc.: *See*—
Truty, Thomas J.; Fricke, William R.; Ceriale, James M.; French, Jule L.; and Newell, Kevin M., 4,945,200, Cl. 219-69.120.
Fortman, Eugene J. Disposable dental floss cassette dispenser system. 4,944,440, Cl. 225-1.000.
Fory, Werner: *See*—
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,792, Cl. 71-92.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,793, Cl. 71-93.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,794, Cl. 71-93.000.
Moser, Hans; Bohner, Beat; and Fory, Werner, 4,944,790, Cl. 71-92.000.
Foshag, Reinhard: *See*—
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Foster, Clark B.: *See*—
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 4,944,723, Cl. 604-110.000.
Foster Wheeler Energy Corporation: *See*—
Seshamani, Venkatraman, 4,944,250, Cl. 122-20.00B.
Fostex Corporation of Japan: *See*—
Sato, Shigemi, 4,945,439, Cl. 360-124.000.
Fougnot, Christine; Jozefowicz, Marcel; and Rosenberg, Robert D., to Commissariat a l'Energie Atomique. Process for the separation and purification of proteases and antiproteases of blood clotting, as well as of the protease/antiprotease complex. 4,945,054, Cl. 435-214.000.
Fournier, Jean; and Delsol, Gilbert, to Societe Anonyme dite : STEIN INDUSTRIE. Device for suspending horizontal heat exchange tubes on a vertical carrier tube, and a method of manufacturing the device. 4,944,254, Cl. 122-511.000.
Fox, Anthony, to TFC Corporation. Trash compactor for sanitary handling of solid waste. 4,944,220, Cl. 100-90.000.
Framatome: *See*—
Beneck, Jean A.; and Claude, Guayre, 4,944,911, Cl. 376-261.000.
Francis, Paul S., to Francis, Paul S. Adjustable resilient reel exerciser. 4,944,511, Cl. 272-137.000.
Franey, John P., to AT&T Bell Laboratories. Corrosion inhibition. 4,944,916, Cl. 422-8.000.
Franke, Albrecht, deceased (by Franke, Renate E., Catharina Franke, legal representatives); Schlecker, Rainer; Gries, Josef; Von Philipsborn, Gerda; and Unger, Liliane, to BASF Aktiengesellschaft. Therapeutic agents containing enantiomers of propafenone. 4,945,114, Cl. 514-652.000.
Franke, Renate E., Catharina Franke, legal representatives: *See*—
Franke, Albrecht, deceased; Schlecker, Rainer; Gries, Josef; Von Philipsborn, Gerda; and Unger, Liliane, 4,945,114, Cl. 514-652.000.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,944,964, Cl. 427-203.000.
Frederick, Stanley H., to Essef. Regenerative diatomaceous earth filter. 4,944,887, Cl. 210-778.000.
Frei, Bruno: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kitano, Noritoshi; Nishida, Akira; Frei, Bruno; and O'Sullivan, Anthony, 4,945,105, Cl. 514-450.000.
Freilich, Steven C.: *See*—
Kempf, Richard J.; Dessauer, Rolf; and Freilich, Steven C., 4,945,020, Cl. 430-49.000.
Freitag, Herbert: *See*—
Kortgen, Bernd; Morgen, Helmut; Heinrichs, Heinz-Josef; Fuhrmann, Castor; and Freitag, Herbert, 4,944,498, Cl. 267-64.110.
Fremy, Raoul: *See*—
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French, Jule L.: *See*—
Truty, Thomas J.; Fricke, William R.; Ceriale, James M.; French, Jule L.; and Newell, Kevin M., 4,945,200, Cl. 219-69.120.
Frick, Roger L.; and Rud, Stanley E., Jr., to Rosemount Inc. Multimodulus pressure sensor. 4,944,187, Cl. 73-718.000.
Fricke, William R.: *See*—
Truty, Thomas J.; Fricke, William R.; Ceriale, James M.; French, Jule L.; and Newell, Kevin M., 4,945,200, Cl. 219-69.120.
Friesen, G. Delbert; Shin, Yun K.; and Hoffman, Lewis, deceased (by Hoffman, Norma, Executrix), to National Starch and Chemical Investment Holding Company. Low softening point metallic oxide glasses suitable for use in electronic applications. 4,945,071, Cl. 501-41.000.
Fritz, James S.: *See*—
Lockridge, James E.; and Fritz, James S., 4,944,878, Cl. 210-683.000.
Frohardt, Allen, to Measurex Corporation. Means of enhancing the sensitivity of a gloss sensor. 4,945,253, Cl. 250-571.000.
Frohberger, Paul-Ernst: *See*—
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,945,101, Cl. 514-383.000.
Frostl, Wolfgang: *See*—
Bencze, William; Frostl, Wolfgang; and Wilhelm, Max, 4,945,092, Cl. 514-252.000.
Fuentes, Raul: *See*—
Aguiar, Ocasio F.; Rodriguez, Facundo T.; and Fuentes, Raul, 4,944,282, Cl. 126-25.00R.
Fuhrman, Esther: *See*—
Butler, Janis Y.; and Fuhrman, Esther, 4,944,164, Cl. 63-12.000.
Fuhrmann, Castor: *See*—
Kortgen, Bernd; Morgen, Helmut; Heinrichs, Heinz-Josef; Fuhrmann, Castor; and Freitag, Herbert, 4,944,498, Cl. 267-64.110.
Fuhrmann, Klaus; Graeser, Ulrich; and Merz, Ludwig, to Veba Oel Technologie GmbH. Process for the hydrogenation of coal. 4,944,866, Cl. 208-408.000.
Fuji Electric Co., Ltd.: *See*—
Kandatsu, Kiyoshi, 4,945,326, Cl. 335-16.000.
Shigekane, Hisao; and Ito, Shinichi, 4,945,396, Cl. 357-46.000.
Fuji Photo Film Co., Ltd.: *See*—
Arai, Naoki; and Kagawa, Kazuo, 4,945,036, Cl. 430-567.000.
Arima, Shinichi, 4,944,503, Cl. 270-95.000.
Deguchi, Naoyasu; and Ohno, Shigeru, 4,945,033, Cl. 430-522.000.
Kaneko, Kiyotaka, 4,945,441, Cl. 360-137.000.
Kikuchi, Yasushi, 4,944,982, Cl. 428-64.000.
Matsumoto, Takashi; and Takesa, Taichi, 4,945,438, Cl. 360-121.000.
Miida, Takashi; and Ozaki, Nozomu, 4,945,377, Cl. 354-402.000.
Momoki, Yasuhito; Hioki, Takanori; and Okazaki, Masaki, 4,945,038, Cl. 430-576.000.
Muraishi, Katsuaki, 4,945,238, Cl. 250-327.200.
Mutoh, Hideki, 4,945,418, Cl. 358-213.110.
Nagashima, Yasuo, 4,945,436, Cl. 360-104.000.
Nakamura, Koichi, 4,945,025, Cl. 430-138.000.
Nakamura, Takashi; and Ogawa, Yasuhisa, 4,945,375, Cl. 354-322.000.
Nakanishi, Kanji, 4,944,805, Cl. 148-108.000.
Saitou, Mitsuo, 4,945,037, Cl. 430-567.000.
Sakai, Minoru; Takahashi, Osamu; and Aoki, Kozo, 4,945,031, Cl. 430-393.000.
Shinada, Hidetoshi, 4,945,315, Cl. 330-4.300.
Sugiyama, Tuyoshi; Takeda, Hideo; Sato, Tsunehiko; and Chikamasa, Hiroshi, 4,944,808, Cl. 134-15.000.
Sunagawa, Hiroshi, 4,945,527, Cl. 369-44.110.
Tomiyama, Hideki; Karino, Yukio; and Hayashi, Hiroshi, 4,945,026, Cl. 430-233.000.
Yabe, Masao; and Inagaki, Yoshio, 4,944,967, Cl. 427-393.500.
Yamamoto, Soichiro, 4,945,023, Cl. 430-138.000.
Fuji Seiko Corporation: *See*—
Suzuki, Yasuhiro; Yoshikawa, Taguo; Shibata, Kazuhiro; Fukui, Akio; and Shiga, Kiyotaka, 4,944,640, Cl. 408-211.000.
Fujihisa, Hiroaki: *See*—
Toda, Haruhisa; Fujihisa, Hiroaki; and Murata, Shiro, 4,945,325, Cl. 335-16.000.
Fujimaki, Hirohiko: *See*—
Horibe, Kinya; and Fujimaki, Hirohiko, 4,944,084, Cl. 29-623.000.
Fujimoto, Takanori; and Hara, Toshiro, to Mitsubishi Denki Kabushiki Kaisha. Method for controlling the operation of an engine for a vehicle. 4,945,485, Cl. 364-431.050.
Fujino, Akihiko, to Minolta Camera Kabushiki Kaisha. Camera capable of inputting and outputting signals between it and external deivce through film sensitivity reading material. 4,945,365, Cl. 354-21.000.
Fujioka, Souichirou: *See*—
Okamoto, Hiroshi; and Fujioka, Souichirou, 4,945,426, Cl. 360-70.000.
Fujioka, Yoshiki, to Fanuc Ltd. Circuit board device for magnetics circuit and method of manufacturing same. 4,945,190, Cl. 174-68.500.
Fujita, Fumio: *See*—
Fukami, Harukazu; Hashimoto, Masaki; Niwata, Shinjiro; Ohtsuka, Norio; and Fujita, Fumio, 4,945,104, Cl. 514-425.000.
Fujita, Minoru: *See*—
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 4,945,215, Cl. 235-457.000.
Fujitsu Limited: *See*—
Suehiro, Yoshiyuki, 4,945,395, Cl. 357-40.000.
Yamada, Kenji, 4,945,469, Cl. 364-200.000.
Fujiwara, Atsumi: *See*—
Sato, Tutomu; Yura, Haruhiko; Nasu, Yoshihiko; Fujiwara, Atsumi; and Mori, Shigeo, 4,945,317, Cl. 330-301.000.
Fukami, Harukazu; Hashimoto, Masaki; Niwata, Shinjiro; Ohtsuka, Norio; and Fujita, Fumio, to Suntory Limited. Maleimide derivatives and use thereof in agricultural and horticultural fungicides. 4,945,104, Cl. 514-425.000.
Fukasawa, Yukihiko: *See*—
Hiroki, Keiichiro; Fukasawa, Yukihiko; and Yamauchi, Ken, 4,945,424, Cl. 358-335.000.

Fukawa, Satoru: *See*—
Ishikawa, Kenichi; Kurita, Koji; Fukawa, Satoru; and Maeda, Kenji, 4,944,822, Cl. 156-212.000.

Fukinuki, Takahiko, to Hitachi, Ltd. Method for producing NTSC compatible signal for widescreen tv system. 4,945,402, Cl. 358-12.000.

Fukuda, Kazushi: *See*—
Iizuka, Tadashi; Fukuda, Kazushi; Ishihara, Shin; Kamitsuma, Yasuo; and Nakagawa, Yusaku, 4,944,663, Cl. 418-178.000.

Fukuda, Takeshi; Amachi, Nobumitsu; Sakama, Mitsunori; Sakamoto, Naoya; and Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor photosensor and driving method therefor. 4,945,226, Cl. 250-214.00R.

Fukuda, Yasushi: *See*—
Nishihara, Tokihiro; and Fukuda, Yasushi, 4,944,086, Cl. 79-837.000.

Fukui, Akio: *See*—
Suzuki, Yasuhiro; Yoshikawa, Tuguo; Shibata, Kazuhiro; Fukui, Akio; and Shiga, Kiyotaka, 4,944,640, Cl. 408-211.000.

Fukumoto, Yuji: *See*—
Suzuki, Hideaki; Hosoda, Kenji; Kubota, Takaharu; and Fukumoto, Yuji, 4,945,039, Cl. 435-7.000.

Fukumura, Kagenori: *See*—
Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,945,482, Cl. 364-424.100.

Fukushige, Fumio; Hori, Hisanobu; and Tanaka, Kiichiro, to Matsushita Electric Industrial Co., Ltd. Printing device. 4,9[illegible],613, Cl. 400-61.000.

Fukushima, Junzo, to Kyowa Machinery Co., Ltd. Position indicator device for conveyed object. 4,944,411, Cl. 209-705.000.

Fukushima, Toshio: *See*—
Sakakibara, Koichi; Masuoka, Kanetaro; and Fukushima, Toshio, 4,944,330, Cl. 137-625.310.

Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, to Kyodo Printing Co., Ltd. Optical recording card having hologram contained therein and method of producing the same. 4,945,215, Cl. 235-457.000.

Fulton Boiler Works, Inc.: *See*—
Fetterly, Richard, 4,944,251, Cl. 122-451.00R.

Funayama, Juuzoh: *See*—
Matsudaira, Takeo; Kouno, Hiroshi; Eda, Shinji; and Funayama, Juuzoh, 4,945,432, Cl. 360-98.020.

Furnas Electric Company: *See*—
Kinney, John W.; Rubasch, Anthony P.; and Degenhart, Thomas W., 4,945,328, Cl. 335-202.000.

Furumoto, Mitsumasa: *See*—
Kawahara, Eiichiro; Ikejiri, Kenichi; Furumoto, Mitsumasa; and Yamamoto, Noboru, 4,944,154, Cl. 60-488.000.

Furusawa, Hironobu: *See*—
Satsuka, Mamoru; and Furusawa, Hironobu, 4,945,191, Cl. 174-69.000.

Furuta, Shoichiro; Kato, Hirohisa; and Seto, Hirohito, to Ito Optical Industrial Co., Ltd. Method for dirtproofing treatment for plastic lens. 4,944,962, Cl. 427-164.000.

Furuya, Masato: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 4,945,423, Cl. 358-300.000.

Fushimi, Hiroyuki: *See*—
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,945,022, Cl. 430-120.000.

Futter, Menachem; Wilson, James E.; and Golden, Annette M., to Revlon, Inc. Powder-applying brush. 4,944,625, Cl. 401-153.000.

Fuyama, Moriaki: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.

G. Creamascoli S.p.A.: *See*—
Barbucci, Rolando; Ferruti, Paolo; Grossi, Adalberto; and Lemm, Wilfried G., 4,944,767, Cl. 623-66.000.

G. D. Searle & Co.: *See*—
Olney, John W., 4,945,097, Cl. 514-318.000.

G.P.B. Beghelli s.r.l.: *See*—
Beghelli, Gian P., 4,945,280, Cl. 315-129.000.

Gaeke, John C., deceased; and by Gaeke, Louise, executrix, to Gaeke, Louise M. Mobile resuscitating apparatus. 4,944,292, Cl. 128-204.180.

Gaeke, Louise, executrix: *See*—
Gaeke, John C., deceased; and Gaeke, Louise, executrix, 4,944,292, Cl. 128-204.180.

Gaeke, Louise M.: *See*—
Gaeke, John C., deceased; and Gaeke, Louise, executrix, 4,944,292, Cl. 128-204.180.

Gagliano, Francis P.; and Hechtlinger, Solomon L., to AT&T Bell Laboratories. Tape conveyers for components. 4,944,979, Cl. 428-43.000.

Gagliano, Vitaliano, to A. T. Avanzata Tecnologia S.R.L. Rotating hideaway sanitary fixture. 4,944,047, Cl. 4-312.000.

Gagnon, Charles E.: *See*—
Haust, Wilhelm M. H.; and Gagnon, Charles E., 4,944,455, Cl. 239-59.000.

Gaignet, Yves, to Millipore, S.A. Plural filter tube sequential distribution apparatus. 4,944,875, Cl. 210-232.000.

Galbraith, Douglas C., to Actel Corporation. Integrated circuit bus switching circuit. 4,945,267, Cl. 307-571.000.

Gale, Michael T.: *See*—
Bell, Frederick K.; Brown, Stephen N.; and Gale, Michael T., 4,945,501, Cl. 364-571.050.

Gallagher, Richard N. Shoulder strap apparatus for carrying weaponry on the person. 4,944,438, Cl. 224-206.000.

Gamgee, Christopher J.; Leigh-Jones, Peter; and Jungo, Charles, to Amskan Limited. Signal discriminator. 4,945,225, Cl. 250-214.00B.

Gana, John W. Tape cutting dispenser. 4,944,441, Cl. 225-16.000.

Ganek, Alan G.: *See*—
Clark, Carl E.; Ganek, Alan G.; Mall, Michael G.; and Page, David R., 4,945,480, Cl. 364-200.000.

Gansen, Peter; Wolf, Klaus-Dieter; and Seel, Klaus, to Bayer Aktiengesellschaft. Liquid polyisocyanate compositions, a process for their preparation, and their use for the preparation of flexible polyurethane foams. 4,945,117, Cl. 521-99.000.

Garcia, Roberto; and da Silva, Jose H., to Petroleo Brasileiro S.A. - PETROBRAS. Process for the granulating of sulphur. 4,944,769, Cl. 23-293.00S.

Garland, R. Darryl, to Roberts, Larry K., a part interest. Writing instrument stand/holder attachable to cap pocket clip. 4,944,624, Cl. 401-131.000.

Garmany, Douglas L.; and Hughes, James B. Lure system with adaptable insitu bill assembly. 4,944,112, Cl. 43-42.090.

Garrison, Britt. Wire wheel hub adapter apparatus. 4,944,562, Cl. 301-111.000.

Garrow, Cecil M.: *See*—
Labelle, H. M. Robert; Cant, Norman H.; and Garrow, Cecil M., 4,944,169, Cl. 70-100.000.

Gass, Karl: *See*—
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,792, Cl. 71-92.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,793, Cl. 71-93.000.
Meyer, Willy; Fory, Werner; and Gass, Karl, 4,944,794, Cl. 71-93.000.

Gately, Michael T.: *See*—
Penz, Perry A.; Gately, Michael T.; and Katz, Alan J., 4,945,494, Cl. 364-513.000.

Gatt, Edward W., to Chrysler Corporation. Stackable nestable tray with central weight bearing hub. 4,944,398, Cl. 206-507.000.

Gaudette, Marvin F.: *See*—
Malone, Peter J.; Thompson, Michael B.; Torrence, Robert J.; and Gaudette, Marvin F., 4,944,160, Cl. 62-180.000.

Gauthier, Rene : *See*—
Sireul, Jacques; and Gauthier, Rene , 4,944,501, Cl. 269-322.000.

Gautier, Jean-Pierre, to Bendix France. System for mounting a booster. 4,944,479, Cl. 248-222.200.

Gaylord Container Corporation: *See*—
Coursen, David D., 4,944,395, Cl. 206-288.000.

Gaylord, Thurmond O., Jr.; and Gaylord, Thurmond O., Sr. Nail polish applicator. 4,944,318, Cl. 132-73.000.

Gaylord, Thurmond O., Sr.: *See*—
Gaylord, Thurmond O., Jr.; and Gaylord, Thurmond O., Sr., 4,944,318, Cl. 132-73.000.

Gebauer, Ludwig, to Hilti Aktiengesellschaft. Use of 2-component reaction resins for fastening purposes. 4,944,819, Cl. 156-78.000.

Gebhard, Albert W.; Knoedler, Roy E.; Parker, Robert M.; and Au, William G., to Gerico, Inc. Foothold security gate. 4,944,117, Cl. 49-55.000.

Gebr. Eickoff Maschinenfabrik u. Eisengiesserie mbH: *See*—
Oberste-Beulmann, Klaus; and Schupphaus, Herbert, 4,944,558, Cl. 299-42.000.

Gebr. Happich GmbH: *See*—
Hilbert, Bernhard; and Hilt, Gerard, 4,944,549, Cl. 296-97.900.

Gebruder Adams Armaturen U. Apparate GmbH & Co., K.G.: *See*—
Adams, Horst H.; Bruggestrath, Bernd; and Kappe, Rudolf A., 4,944,489, Cl. 251-306.000.

Gehret, Jon F., to Eastman Kodak Company. Lamp for scanning apparatus. 4,945,285, Cl. 313-278.000.

Gehring, Reinhold: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter, 4,945,165, Cl. 548-362.000.

Geiger, Thomas; and Engel, Wolf D., to Boehringer Mannheim GmbH. Process and reagent for the determination of an antibody. 4,945,042, Cl. 435-7.000.

Geist, Michael: *See*—
Schon, Georg; Ott, Gunter; and Geist, Michael, 4,944,855, Cl. 204-181.700.

Gelsthorpe, John R.: *See*—
Thrower, Anthony; and Gelsthorpe, John R., 4,944,496, Cl. 266-220.000.

Genentech, Inc.: *See*—
Ammann, Arthur J., 4,944,941, Cl. 424-85.500.

General Dynamics Corporation, Convair Division: *See*—
Hilal, Mohamed A., 4,944,212, Cl. 89-8.000.

General Dynamics Corp., Pomona Div.: *See*—
Wedertz, Larry D.; Vazquez, Jose R.; and Schoneman, Scott R., 4,944,226, Cl. 102-476.000.

General Electric CGR SA: *See*—
Sireul, Jacques; and Gauthier, Rene , 4,944,501, Cl. 269-322.000.

General Electric CGR S.A.: *See*—
Beauzamy, Jacques, 4,945,223, Cl. 250-213.0VT.

General Electric Company: *See*—
Abolins, Visvaldis; Betts, Joseph E.; Holub, Fred F.; and Lee, Gim F., Jr., 4,945,018, Cl. 524-141.000.
Cho, Hyun S., 4,944,772, Cl. 51-293.000.
DeBiasi, Mark S.; Danek, Robert J.; Sailer, Hanns P.; Goldman, Ira B.; and Leslie, David J., 4,945,443, Cl. 361-93.000.
Doughty, Dennis J.; Seymour, Raymound K.; and Maulandi, Aymon A., 4,945,327, Cl. 335-201.000.
Jenkins, Thomas E.; and Beers, David G., 4,944,157, Cl. 62-407.000.
Kuwata, Masayoshi, 4,944,149, Cl. 60-39.230.
Motsinger, Russell E.; and Vdoviak, John W., 4,944,362, Cl. 181-213.000.
Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
Rich, Jonathan D.; McDermott, Philip J.; Davis, Gary C.; Policastro, Peter P.; Regh, Karen A.; Hernandez, Pamela K.; and Guggenheim, Thomas L., 4,945,148, Cl. 528-26.000.
Sabatella, Robert J.; Mrowka, Joseph J.; McCuin, Jon P.; Robarge, Dean A.; Perzan, Denis A.; Markowski, Robert G.; and Reid, David A., 4,945,450, Cl. 361-334.000.
Singh, Raj N.; and Morrison, William A., 4,944,904, Cl. 269-60.000.
Staub, Fred W., 4,945,562, Cl. 378-130.000.
Ting, Sai-Pei, 4,945,131, Cl. 525-68.000.
Vohland, Marion G.; Odom, Edwin M.; and Harris, Herbert H., Jr., 4,944,671, Cl. 432-8.000.

General Electric Company, p.l.c., The: *See*—
Bagshaw, John M.; Kent, Lionel W. J.; Willats, Terence F.; and Payne, Steven J., 4,945,539, Cl. 372-13.000.

General Motors Corporation: *See*—
Kumar, Sudhir; Kumar, Shiv R.; and Becker, Dean A., 4,944,539, Cl. 291-2.000.

Gentron Corporation: *See*—
Schmerda, Richard F.; Dombeck, John A.; and Kaufman, Lance R., 4,945,445, Cl. 361-101.000.

Genz, Joachim; Dicke, Hans-Rudolf; Grigo, Ulrich; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Molding compositions of polycarbonate, thermotropic polymer, graft polymer and fluorinated polyolefin. 4,945,130, Cl. 525-67.000.

George, Albert L.; and Gooch, Don, to Crawfish Technology of South Carolina, Inc. System for harvesting crustaceans. 4,944,108, Cl. 43-6.500.

George, Pascal; and Sevrin, Mireille, to Synthelabo. Treatment of a depressive state with 2-[(4-piperidyl)methyl]-1,2,3,4-tetrahydroisoquinoline derivates. 4,945,096, Cl. 514-307.000.

Georget, Pierre, to Hutchinson. Ribbed belt for power transmission. 4,944,717, Cl. 474-238.000.

Georgia-Pacific Corporation: *See*—
Jespersen, Paul W., 4,944,466, Cl. 242-55.300.

Georgia Tech Research Corporation: *See*—
Gole, James L.; Woodward, James R.; and Cobb, Stephen H., 4,945,546, Cl. 372-89.000.

Gephart, Randall J.: *See*—
Schroeder, Roger A.; Broyden, Robert H.; Dearstyne, Robert C.; Magner, Joseph L.; Gephart, Randall J.; Dayton, David W.; and Newman, Raymond A., 4,944,056, Cl. 5-81.00R.

Ger, Ralph: *See*—
Oddsen, Robert R.; and Ger, Ralph, 4,944,443, Cl. 227-19.000.

Gerber, Martin, to Boehringer Mannheim GmbH. Process and reagent for the determination of α-amylase. 4,945,043, Cl. 435-7.000.

Gerhard Collardin GmbH: *See*—
Hosemann, Kurt; and Opitz, Reinhard, 4,944,813, Cl. 148-260.000.

Gericke, Stephen H.: *See*—
Carrell, Michael W.; and Gericke, Stephen H., 4,944,728, Cl. 604-164.000.

Gerico, Inc.: *See*—
Gebhard, Albert W.; Knoedler, Roy E.; Parker, Robert M.; and Au, William G., 4,944,117, Cl. 49-55.000.

Gerson, Ira A.; and Lindsley, Brett L., to Motorola, Inc. Method for terminating a telephone call by voice command. 4,945,570, Cl. 381-110.000.

Gerstenberg, Bruno; Michling, Hans J.; and Vachek, Josef. Filter arrangement. 4,945,323, Cl. 333-185.000.

Gertz, Jonathan, to Audio Authority Corporation. Solderless electrical connector. 4,944,686, Cl. 439-175.000.

Gesika Buromobelwerk GmbH & Co. KG: *See*—
Jahnke, Eitelfriedrich; and Hansel, Detlef, 4,944,235, Cl. 108-157.000.

Gessell, Donald E.; and Hosman, Donald P., to Conoco Inc. Composition and process for friction loss reduction. 4,945,142, Cl. 526-128.000.

Geyer, Paul. Extrusion apparatus. 4,944,597, Cl. 366-79.000.

Ghali, Mounir M.; and Hedges, Winston L., to Hexcel Corporation. Densified polyethersulfone. 4,945,154, Cl. 528-480.000.

Gialanella, Joseph: *See*—
Gogan, James M.; and Gialanella, Joseph, 4,945,212, Cl. 219-388.000.

Giani, Carlo: *See*—
Grabley, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, 4,945,108, Cl. 514-475.000.

Gibbs, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., to Minnesota Mining and Manufacturing Company. Particular ceramic useful as a proppant. 4,944,905, Cl. 264-62.000.

Gibson, Baylor D.: *See*—
Felton, Clinton D.; Gibson, Baylor D.; Jamison, Charles E.; McWhorter, William O.; and Serad, George A., 4,944,854, Cl. 204-168.000.

Gierer, Georg, to Zahnradfabrik Friedrichshafen AG. Electrohydraulic control for an automatically shiftable automotive transmission. 4,944,202, Cl. 74-869.000.

Gifford, Eric P.; and Roblin, William J., to Automated Packaging Systems, Inc. Labeling apparatus. 4,944,825, Cl. 156-294.000.

Gilbert, Kervagoret, to Bendix France. Hydraulic brake circuit for a motor vehicle equipped with wheel anti-lock and anti-slip devices. 4,944,565, Cl. 303-110.000.

Gill, Gerald L., Jr.; and Hyde, Thomas C., to Westech Systems, Inc. Apparatus for transporting wafer to and from polishing head. 4,944,119, Cl. 51-215.00R.

Gillis, Robert E. Foldable tent. 4,944,322, Cl. 135-105.000.

Gingrich, Harold L.: *See*—
Scally, Henry A.; and Gingrich, Harold L., 4,944,190, Cl. 73-861.580.

Giorgetti, Alberto, to Via Provinciale. Disc brake with a caliper body and pads retained in the caliper body by hooks. 4,944,371, Cl. 188-73.390.

Girard, Lawrence; and Meyer, E. Walter, to Greenville Machinery Coropration. Continuous cotton wet finishing. 4,944,070, Cl. 19-66.0CC.

GKD Gebr. Kufferath GmbH & Co. KG: *See*—
Graff, Wilhelm, 4,944,716, Cl. 474-255.000.

Glasdon Group Limited: *See*—
Handy, Keith, 4,944,493, Cl. 256-23.000.

Glaser, Stephen B. Ceiling fan blade mounted air freshner dispensing device. 4,944,898, Cl. 261-84.000.

Glassman, Joseph T. Exhaust hood for pizza ovens. 4,944,285, Cl. 126-299.00D.

Globe-Union Inc.: *See*—
Bowen, Gerald K.; and Zagrodnik, Jeffrey P., 4,945,019, Cl. 429-72.000.

Glorieux, Jean-Marie A.; and Gouget, Jean-Pierre M. D., to Societe Anonyme DIMECO ALIPRESSE. Metal plate bending machine. 4,944,176, Cl. 72-319.000.

Gmur, Bruno; and Kuhnemund, Bernd. Apparatus for the automatic determination of a continuous bulk material throughput by means of a continuous balance. 4,944,428, Cl. 222-55.000.

Gneiss, Heinz; Kienzle, Wolfgang; Sauer, Rudolf; and Wuensch, Werner, to Robert Bosch GmbH. Air flow rate meter and method for producing an air flow rate meter. 4,944,182, Cl. 73-204.260.

Go, Yasunao: *See*—
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, 4,945,335, Cl. 340-426.000.

Gobbo, Joao C.: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

Goble, Robert H. Apparatus and method for recovering materials from fluid bodies. 4,944,101, Cl. 137-15.000.

Goerlich, Dieter; Kolodzie, Rainer; and Reiter, Rainer, to Webasto AG Fahrzeugtechnik. Burner for hard-to-ignite mixtures. 4,944,153, Cl. 60-303.000.

Goet, Richard C. Hygienic suspension for dental or medical instruments. 4,944,410, Cl. 433-28.000.

Gogan, James M.; and Gialanella, Joseph, to Savory Equipment, Inc. Thermal radiation device. 4,945,212, Cl. 219-388.000.

Gohl, Pierre; Llabres, Raymond; and Malgouires, Pascal, to La Telemecanique Electrique. Printed circuit with thermal drain. 4,945,451, Cl. 361-386.000.

Gold, Jeffrey W.; and Nickens, Dan A., to Earth Resources Consultants, Inc. Cylinder rupture vessel with clamps for immobilizing a container inside the vessel. 4,944,333, Cl. 141-51.000.

Gold, Michael N.: *See*—
Peery, John R.; Gold, Michael N.; Schorr, Saadia M.; and Gorby, Jack, 4,944,060, Cl. 5-453.000.

Goldbach GmbH, Holz-, Kunststoff- und Metallverarbeitung: *See*—
Pallhorn, Sebald, 4,944,130, Cl. 52-802.000.

Goldberg, Edward M.; Melinyshyn, Lev; Jaron, Michael; and Stupar, Jeffrey M., to Uresil Corporation. Apparatus for locating body cavities having signaling indicator. 4,944,724, Cl. 604-118.000.

Golden, Annette M.: *See*—
Futter, Menachem; Wilson, James E.; and Golden, Annette M., 4,944,625, Cl. 401-153.000.

Goldman, Ira B.: *See*—
DeBiasi, Mark S.; Danek, Robert J.; Sailer, Hanns P.; Goldman, Ira B.; and Leslie, David J., 4,945,443, Cl. 361-93.000.

Gole, James L.; Woodward, James R.; and Cobb, Stephen H., to Georgia Tech Research Corporation. Purely chemical process yielding continuous laser amplification in the visible and ultraviolet spectral ranges. 4,945,546, Cl. 372-89.000.

Gooch, Don: *See*—
George, Albert L.; and Gooch, Don, 4,944,108, Cl. 43-6.500.

Good, Stanley B.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; Good, Stanley B.; and Hendrix, Troy C., 4,944,527, Cl. 280-741.000.

Goodley, George R.; and Taylor, Harold J., to Du Pont de Nemours, E. I., and Company. Continuous production of polyester filaments. 4,945,151, Cl. 528-272.000.

Goodman, Seth; and Hanna, Alan, to Extrel FTMS, Inc. Method and apparatus for producing an arbitrary excitation spectrum for Fourier transform mass spectrometry. 4,945,234, Cl. 250-291.000.

Goodson, Theodore, Jr.: *See*—
Bollinger, Nancy G.; Goodson, Theodore, Jr.; and Herron, David K., 4,945,099, Cl. 514-381.000.

Gorby, Jack: *See*—
Peery, John R.; Gold, Michael N.; Schorr, Saadia M.; and Gorby, Jack, 4,944,060, Cl. 5-453.000.

Gosling, Christopher D.: *See*—
Hobbs, Simon H.; and Gosling, Christopher D., 4,945,175, Cl. 585-417.000.

Goto, Akihiro: *See*—
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Teramoto, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, 4,945,487, Cl. 364-474.020.

Goto, Eizo: *See*—
Oda, Goro; Nagata, Niro; Nakatomi, Yoshitsugu; Sawafuji, Takashi; Shinozaki, Yoshihisa; and Goto, Eizo, 4,944,786, Cl. 65-154.000.

Goto, Yasuhiro: *See*—
Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, 4,944,746, Cl. 606-195.000.

Gotzen, L.; Kunze, Karl-Heinz; and Techow, Claudius, to Mecron Medizinische Produkte GmbH. Spinal Fixation device. 4,944,743, Cl. 606-61.000.

Gouget, Jean-Pierre M. D.: *See*—
Glorieux, Jean-Marie A.; and Gouget, Jean-Pierre M. D., 4,944,176, Cl. 72-319.000.

Gough, Rex M. K., to Pitney Bowes Inc. Paper folding apparatus. 4,944,131, Cl. 53-117.000.

Gough, Rex M. K., to Pitney Bowes Inc. Paper handling apparatus. 4,944,136, Cl. 53-493.000.

Goulart, Joseph S.: *See*—
Orlando, Franklin P.; Butler, Lee D.; Luttrell, Donald A.; and Goulart, Joseph S., 4,944,141, Cl. 56-17.100.

Gould, Royston M.: *See*—
Doman, Trevor D.; Buttery, John R.; and Gould, Royston M., 4,944,359, Cl. 180-208.000.

Grabley, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, to Hoechst Aktiengesellschaft. Angucyclinones from streptomycetes, a process for the preparation thereof, and the use thereof. 4,945,108, Cl. 514-475.000.

Grabner, Bernd; Dotsch, Lorenz; Knauder, Josef; and Hoffgen, Hans, to Radex-Heraklith Industriebeteilgungs AG. Flushing block. 4,944,497, Cl. 266-268.000.

Grace, Carol. Toy-shaped musical nurser. 4,944,704, Cl. 446-74.000.

Gradel, Wolf-Dietrich: *See*—
Dick, Helmut; Gradel, Wolf-Dietrich; and Weber, Mathias, 4,945,181, Cl. 564-212.000.

Gradoboev, Vladimir T.; Melnikov, Leonid I.; Klimenov, Alexandr M.; and Sitnikov, Alexandr E. Apparatus for orienting parts in feeding devices of various units. 4,944,382, Cl. 198-399.000.

Graeser, Ulrich: *See*—
Fuhrmann, Klaus; Graeser, Ulrich; and Merz, Ludwig, 4,944,866, Cl. 208-408.000.

Graf, Gerhard: *See*—
Grill, Michael; and Graf, Gerhard, 4,944,928, Cl. 423-161.000.

Graf, Lothar; Maerte, Leo; and Skorka, Thomas, to Ing. Erich Pfeiffer GmbH & Co. KG. Fluid dispenser. 4,944,430, Cl. 222-259.000.

Graff, Wilhelm, to GKD Gebr. Kufferath GmbH & Co. KG. Wire netting belt. 4,944,716, Cl. 474-255.000.

Graham, Thomas G.: *See*—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 4,945,559, Cl. 379-399.000.

Grant, Andrew I.; MacPherson, Martyn T.; and Stevens, David G., to British Petroleum Company plc, The. Remote sensing system. 4,945,249, Cl. 250-461.100.

Grassens, Leonardus J.: *See*—
Jansen, Gerardus L. M.; Grassens, Leonardus J.; and Hollen, Zdenek T., 4,945,526, Cl. 369-44.110.

Green Cross Corporation, The: *See*—
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.

Greene, Benny A., to Electro Optic Systems Pty. Ltd. Laser beam processing apparatus. 4,945,547, Cl. 372-94.000.

Greene, Thomas F. Apparatus for removing flashing from bottles. 4,944,667, Cl. 425-317.000.

Greeno, Donald R. War game marking grenade. 4,944,521, Cl. 273-428.000.

Greenville Machinery Coropration: *See*—
Girard, Lawrence; and Meyer, E. Walter, 4,944,070, Cl. 19-66.0CC.

Greer, S. Thomas: *See*—
Leathers, Amy Z.; and Greer, S. Thomas, 4,944,892, Cl. 252-92.000.

Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., to Mobil Solar Energy Corporation. Method of passivating crystalline substrates. 4,945,065, Cl. 437-4.000.

Grey, Roger A.; Karas, Lawrence J.; and Verkruyse, Linda A., to Atlantic Richfield Company. Ether sulfoxide compounds for enhanced oil recovery. 4,944,346, Cl. 166-274.000.

Gries, Josef: *See*—
Franke, Albrecht, deceased; Schlecker, Rainer; Gries, Josef; Von Philipsborn, Gerda; and Unger, Liliane, 4,945,114, Cl. 514-652.000.

Griesbaum, Theodore J.; Lydic-Mettler, Joan S.; Flores, Pamela A.; Jasek, Anthony B.; and Wrzensinski-Conran, Mary A., to Brighton School Incorporated. Supportive chair, adjustable for growing with a child. 4,944,556, Cl. 297-437.000.

Griffin, Patrick K.: *See*—
Cardin, Joseph M.; Fremy, Raoul; and Griffin, Patrick K., 4,944,329, Cl. 137-614.050.

Grigo, Ulrich: *See*—
Genz, Joachim; Dicke, Hans-Rudolf; Grigo, Ulrich; and Nouvertne, Werner, 4,945,130, Cl. 525-67.000.

Grill, Hans-Joerg: *See*—
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, 4,945,064, Cl. 436-503.000.

Grill, Michael; and Graf, Gerhard, to Veitscher Magnestiwerke-Actien-Gesellschaft. Process for producing pure magnesium oxide. 4,944,928, Cl. 423-161.000.

Grimmer, Paul D.: *See*—
Swiatoaz, Edmund; and Grimmer, Paul D., 4,944,293, Cl. 128-205.240.

Grindley, June: *See*—
Hardy, Kimber; van de Pol, Hendrick; Grindley, June; and Payton, Mark A., 4,945,052, Cl. 435-172.300.

Grindrod, Paul E.; and Hustad, Gerald O., to Oscar Mayer Foods Corporation. Method of forming a reclosable package. 4,944,134, Cl. 53-432.000.

Groenewegen, Johannes B., to Sundstrand Data Control, Inc. Crash survivable enclosure for flight recorder. 4,944,401, Cl. 206-521.000.

Grohsmeyer, Paul D.: *See*—
Wible, John E.; and Grohsmeyer, Paul D., 4,944,357, Cl. 180-169.000.

Gross, Clifford M.; and Santos, James P. Active biomechanical chair. 4,944,554, Cl. 297-284.000.

Grossi, Adalberto: *See*—
Barbucci, Rolando; Ferrusi, Paolo; Grossi, Adalberto; and Lemm, Wilfried G., 4,944,767, Cl. 623-66.000.

Grubbs, Robert H.; and Novak, Bruce M., to California Institute of Technology. Ring opening metathesis polymerization of strained cyclic ethers. 4,945,135, Cl. 525-338.000.

Grubbs, Robert H.; and Novak, Bruce M., to California Institute of Technology. Ring opening metathesis polymerization of strained cyclic ethers. 4,945,141, Cl. 526-90.000.

Grubbs, Robert H.; and Novak, Bruce M., to California Institute of Technology. Ring opening methathesis polymerization of strained cyclic ethers. 4,945,144, Cl. 526-268.000.

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Thiele, Harmut; Gruber, Leo; and Toral, Jose , 4,944,407, Cl. 206-628.000.

Grue-Sorensen, Gunnar; and Nielsen, Christian K., to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab). Novel propane-1,3-diol derivatives and use. 4,945,098, Cl. 514-365.000.

Grumman Aerospace Corporation: *See*—
Egan, Walter G., 4,944,579, Cl. 350-396.000.
Picard, Gary A.; and Rao, Hayagriva V., 4,945,258, Cl. 307-270.000.

Grunbauer, Henri J. M.: *See*—
Smits, Guide F.; and Grunbauer, Henri J. M., 4,945,119, Cl. 521-131.000.

Grzemba, Barbara: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, 4,945,004, Cl. 428-469.000.

GTE Laboratories Incorporated: *See*—
Boudreau, Robert A.; and LaCourse, Joanne S., 4,944,569, Cl. 350-96.200.

GTE Products: *See*—
McColl, James R., 4,945,354, Cl. 340-825.310.

GTE Products Corporation: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,944,797, Cl. 420-469.000.
Morris, Merle E.; Martin, Michael L.; Neff, Louis D.; and Kendrick, George B., 4,945,288, Cl. 313-25.000.

Guerrant, Terrence L.: *See*—
Kent, Walter R.; and Guerrant, Terrence L., 4,944,452, Cl. 229-120.210.

Guggenheim, Thomas L.: *See*—
Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
Rich, Jonathan D.; McDermott, Philip J.; Davis, Gary C.; Policastro, Peter P.; Regh, Karen A.; Hernandez, Pamela K.; and Guggenheim, Thomas L., 4,945,148, Cl. 52° 26.000.

Gulliver, David J., to BP Chemicals Limited. Process for the recovery of metals. 4,944,927, Cl. 423-22.000.

Gunn, Bradley R., to Varian Associates, Inc. High voltage DC power supply. 4,945,464, Cl. 363-61.000.

Gupta, Amitava; Liang, Ranty H.; and Yavrouian, Andre H., to California Institute of Technology. Internal stabilization of polycarbonate resins. 4,945,001, Cl. 428-412.000.

Gupta, Dipak, to Du Pont de Nemours, E. I., and Company. Process for preparation of tooling of carbon fiber reinforced polyimide for composites manufacture. 4,944,824, Cl. 156-286.000.

Gurley, Thomas D.; and Sendelweck, Gene K., to RCA Licensing Corporation. Compensator for temperature-induced black level drift for use in a television receiver. 4,945,414, Cl. 358-168.000.

Guthrie, William L.: *See—*
Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.

Guy, Bessey; and Bouchut, Jean-Yves, to Clecim. Process and installation for preparing metal billets to be extruded. 4,944,206, Cl. 83-42.000.

Gwathmay, Owen: *See—*
Gwathmey, Owen M.; Sloane, Thomas E., Jr.; and Oddsen, Robert R., 4,944,295, Cl. 227-176.000.

Gwathmey, Owen M.; Sloane, Thomas E., Jr.; and Oddsen, Robert R., to Gwathmay, Owen. Suturing assembly. 4,944,295, Cl. 227-176.000.

Gwozdz, Garry T.: *See—*
Micale, Fortunato J.; and Gwozdz, Garry T., 4,945,121, Cl. 523-339.000.

Gyben, Christopher J. Riser check valve. 4,944,327, Cl. 137-519.500.

Gyoutoku, Yasuhiro: *See—*
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,945,364, Cl. 346-160.000.

Haaser, James D., to Dynamic Research and Development Corp. Torque limiter. 4,944,379, Cl. 192-150.000.

Haber, Terry M.; Foster, Clark B.; and Smedley, William H., to Habley Medical Technology Corporation. Universal disposable safety syringe system. 4,944,723, Cl. 604-110.000.

Habley Medical Technology Corporation: *See—*
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 4,944,723, Cl. 604-110.000.

Haeg, Daniel C.: *See—*
Doan, Phong D.; Cobian, Kenneth E.; Upton, James E.; and Haeg, Daniel C., 4,944,088, Cl. 29-858.000.

Haga, Toshio: *See—*
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 4,945,215, Cl. 235-457.000.

Hagino, Seiichiro: *See—*
Nonaka, Shiro; Hagino, Seiichiro; and Ando, Tsukasa, 4,944,237, Cl. 112-315.000.

Hagiwara, Yoshimune: *See—*
Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, 4,945,506, Cl. 364-736.000.

Hahn, Erwin: *See—*
Baus, Ulf; Reuther, Wolfgang; and Hahn, Erwin, 4,945,167, Cl. 548-375.000.

Hahn, Mark C., to Videonics Incorporated. Method and an apparatus for controlling a video cassette recorder. 4,945,425, Cl. 360-15.000.

Hakko Metal Industries Limited: *See—*
Yoshimura, Hiroshi, 4,945,210, Cl. 219-241.000.

Hald, Andre , to Bull, S.A. Local network testing using carrier sense multiple access and collision detection (CSMA/CD). 4,945,532, Cl. 370-13.000.

Halliburton Company: *See—*
Whiteley, Thomas G.; and Cavender, Travis W., 4,944,348, Cl. 166-278.000.

Halliburton Logging Services Inc.: *See—*
Barker, James M., 4,944,225, Cl. 102-202.500.

Hamada, Kousuke: *See—*
Yagi, Hisanori; Hamada, Kousuke; Nakano, Isamu; Nishimura, Yoshihiro; Matsubayashi, Hajime; and Tani, Hisashi, 4,944,959, Cl. 427-14.100.

Hamai, Kyugo: *See—*
Matayoshi, Yutaka; Nakagawa, Yasuhiko; Hamai, Kyugo; and Kamegaya, Shigeru, 4,944,256, Cl. 123-90.240.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Koishi, Musubu; Tsujimura, Etsuo; Watanabe, Motoyuki; and Tsuchiya, Yutaka, 4,945,224, Cl. 250-213.0VT.
Yamashita, Takaji; and Uchida, Hiroshi, 4,945,241, Cl. 250-367.000.

Hamano, Yukio: *See—*
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.

Hamaya, Toru; and Horikoshi, Koki, to Research Development Corporation; Hamaya, Toru; and Horikoshi, Koki, a part interest. Method for preparing magnetic powder. 4,945,049, Cl. 435-168.000.

Hambright, Jerry S.: *See—*
Hambright, John W.; and Hambright, Jerry S., 4,944,219, Cl. 99-581.000.

Hambright, John W.; and Hambright, Jerry S. Torsion leverage nutcracker. 4,944,219, Cl. 99-581.000.

Hamilton, Kenneth B. Automobile portable hauler. 4,944,434, Cl. 224-42.45R.

Hammer, Erling: *See—*
Mylvaganam, Kanagasaba; and Hammer, Erling, 4,945,276, Cl. 310-326.000.

Hammond, Peter R.; and Feeman, James F., to United States of America, Energy. Novel fluorinated laser dyes. 4,945,176, Cl. 349-227.000.

Hamstra, James R.: *See—*
Rusterholz, John T.; Homan, Charles J.; Brown, Lowell E.; Bennett, Donald B.; Malnati. Robert J.; and Hamstra, James R., 4,945,479, Cl. 364-200.000.

Hanawa, Nobumichi: *See—*
Kashima, Mitsuhiro; and Hanawa, Nobumichi, 4,944,705, Cl. 440-61.000.

Hancock, David; and Bond, Thomas, to Eastman Kodak Company. Digital data apparatus with datastrip compression and expansion. 4,945,214, Cl. 235-456.000.

Hancu, Marius, to Northern Telecom Limited. Method and apparatus for testing digital systems. 4,945,536, Cl. 371-22.300.

Handelsvennootschap onder de firma Stengelbengel B.V.: *See—*
De Groot, Franciscus J.; De Swart, Jan W.; and Boerhoop, Jan, 4,944,092, Cl. 30-134.000.

Handy, Keith, to Glasdon Group Limited. Post and rail assembly. 4,944,493, Cl. 256-23.000.

Hankison, Paul M.: *See—*
Clark, Mary J.; and Hankison, Paul M., 4,944,423, Cl. 220-20.000.

Hanna, Alan: *See—*
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Hanoka, Jack I.: *See—*
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Hansel, Detlef: *See—*
Jahnke, Eitelfriedrich; and Hansel, Detlef, 4,944,235, Cl. 108-157.000.

Hansen, John B.: *See—*
Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling, 4,945,090, Cl. 514-232.800.

Hara, Fumihiko; Hayashi, Shuji; and Yamada, Genjiro, to Tsubakimoto Chain Company; and Kabushiki Kaisha Nikken. Operation confirmatory circuit for linear actuator. 4,945,295, Cl. 318-490.000.

Hara, Kozo: *See—*
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Hara, Toshiro: *See—*
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Harada Kogyo Kabushiki Kaisha: *See—*
Egashira, Yoshimi, 4,945,361, Cl. 343-715.000.

Harada, Kouhei; and Hasegawa, Hiromi, to Aisin Seiki Kabushiki Kaisha. Automatic transmission with a power take-off mechanism. 4,944,193, Cl. 74-15.860.

Harada, Masaaki, to Clarion Co., Ltd. Maximum length linearly occurring code sequence generator. 4,945,537, Cl. 371-37.100.

Harada, Tsuneo: *See—*
Kurauchi, Yasuhiro; Akazawa, Michihiro; Harada, Tsuneo; Oyama, Kiyotaka; and Tokuda, Akira, 4,944,852, Cl. 204-131.000.

Harada, Yoshiharu: *See—*
Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,945,482, Cl. 364-424.100.

Haralampiev, Georgi A.: *See—*
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Hardiman, Christopher J.; and Bowers, Gary R., to Monsanto Company. Allyloxy activated coating compositions. 4,945,143, Cl. 526-206.000.

Hardy, Donald P., Jr.; and Parker, Eric C., to Illinois Tool Works. End link for stabilizer bar. 4,944,523, Cl. 280-689.000.

Hardy, Harold, Jr., to Rock-Way, Inc. Open top dump trailer tarping system. 4,944,551, Cl. 296-100.000.

Hardy, Kimber; van de Pol, Hendrick; Grindley, June; and Payton, Mark A., to Biogen, Inc. Production of a Vitamin C precursor using genetically modified organisms. 4,945,052, Cl. 435-172.300.

Harel, Jean-Claude, to Interpatents Ltd. Electronic supply system for fluorescent tubes with electrodes. 4,945,289, Cl. 315-226.000.

Hareng, Michel: *See—*
Aigrain, Pierre; Mourey, Bruno; Dubois, Jean C.; Hareng, Michel; and Robin, Philippe, 4,944,575, Cl. 350-333.000.

Harigae, Masatoshi, to Kabushiki Kaisha Toshiba. Star sensor. 4,944,587, Cl. 356-152.000.

Harper, Jarvis: *See—*
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Harper, M. J. K.: *See—*
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Harreus, Albrecht: *See—*
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Harris Corporation: *See—*
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Piasecki, Douglas S., 4,945,262, Cl. 307-451.000.

Harris, Darrell D.: *See—*
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Harris, David S., to Weber Aircraft, Inc. Stowable table system. 4,944,552, Cl. 297-145.000.

Harris, Herbert H., Jr.: *See—*
Vohland, Marion G.; Odom, Edwin M.; and Harris, Herbert H., Jr., 4,944,671, Cl. 432-8.000.

Harris, Robert S.: *See—*
Szlaga, Emil; Harris, Robert S.; and Thompson, Robert H., 4,944,779, Cl. 55-168.000.

Harrison, Charles F.: *See—*
Ferren, Bran; Harrison, Charles F.; Hope, Clinton B.; and Kohut, Robert J., 4,945,459, Cl. 362-284.000.

Hart, Bobbie M. Pin retractor for semi-trailer tandems. 4,944,522, Cl. 280-149.200.

Hartl, James C.: *See*—
Sasaki, Elric W.; and Hartl, James C., 4,945,230, Cl. 250-227.210.

Hartleif, Karl-Heinz, to Hartleif Metalldecken GmbH. Ceiling lining. 4,944,129, Cl. 52-486.000.

Hartleif Metalldecken GmbH: *See*—
Hartleif, Karl-Heinz, 4,944,129, Cl. 52-486.000.

Hartman, Guy J.; and Spyres, Gary G., to A. E. Staley Manufacturing Company. Purification of hydrolysed protein with crystalline zeolite. 4,944,953, Cl. 426-271.000.

Hartman, Marvis E.: *See*—
Poole, James E.; and Hartman, Marvis E., 4,945,003, Cl. 428-462.000.

Haruyama, Hiroshi: *See*—
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.

Hasegawa, Akira: *See*—
Katayama, Hideaki; Hasegawa, Akira; and Sakaguchi, Katsuyoshi, 4,944,951, Cl. 425-58.100.

Hasegawa, Hirofumi; Kojima, Hiroaki; Matsuura, Yasuhiro; Ohmori, Naoto; and Yamada, Yukio, to Minolta Camera Kabushiki Kaisha. Image-forming apparatus. 4,945,390, Cl. 355-321.000.

Hasegawa, Hiromi: *See*—
Harada, Kouhei; and Hasegawa, Hiromi, 4,944,193, Cl. 74-15.860.

Hasegawa, Shumpei; Takahashi, Yasushi; and Mishima, Yoshibumi, to Honda Giken Kogyo Kabushiki Kaisha. Direct-injection diesel engine. 4,944,266, Cl. 123-302.000.

Hasegawa, Takahiro: *See*—
Shimoma, Taketoshi; Kohigoe, Shinpei; and Hasegawa, Takahiro, 4,945,284, Cl. 313-414.000.

Hashimoto, Kenichi: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.

Hashimoto, Masaki: *See*—
Fukami, Harukazu; Hashimoto, Masaki; Niwata, Shinjiro; Ohtsuka, Norio; and Fujita, Fumio, 4,945,104, Cl. 514-425.000.

Hashimoto, Masayuki: *See*—
Murasaki, Akira; and Hashimoto, Masayuki, 4,944,264, Cl. 123-195.00C.
Nagano, Seishi; Hashimoto, Masayuki; and Murasaki, Akira, 4,944,263, Cl. 123-193.00H.

Hashimoto, Takeshi; and Maeda, Keisuke, to Minolta Camera Kabushiki Kaisha. Device for controlling a zoom lens of a camera. 4,945,371, Cl. 354-195.130.

Hashimoto, Takeshi, to Minolta Camera Kabushiki Kaisha. Display system for camera. 4,945,373, Cl. 354-217.000.

Hasl, Siegfried C.; and Lisnet, Charles J., to Hassl, Siegfried C. Rotary arm label transfer apparatus in combination with molding apparatus. 4,944,665, Cl. 425-116.000.

Hassl, Siegfried C.: *See*—
Hasl, Siegfried C.; and Lisnet, Charles J., 4,944,665, Cl. 425-116.000.

Hasson, Harrith M. Laproscopic instrument with pivotable support arm. 4,944,741, Cl. 606-206.000.

Hattori, Tatsuya: *See*—
Nishino, Hideo; Hattori, Tatsuya; Kushida, Tsuneharu; and Kumata, Masataka, 4,945,153, Cl. 528-337.000.

Hauck, Frederick A.: *See*—
Schneider, Richard T.; and Hauck, Frederick A., 4,944,771, Cl. 48-197.00R.

Haufler, Maurice: *See*—
Temeyer, Kevin B.; Haufler, Maurice; and Pruett, John H., 4,945,057, Cl. 435-240.270.

Haug, Reinhold, to J. Kohle GmbH & Co. KG. Plug fastener. 4,944,073, Cl. 24-590.000.

Haugland, Richard P.; and Whitaker, James, to Molecular Probes, Inc. Xanthene dyes having a fused (C) benzo ring. 4,945,171, Cl. 549-224.000.

Haust, Wilhelm M. H.; and Gagnon, Charles E., to Kinney Canada Inc. Air treating device. 4,944,455, Cl. 239-59.000.

Hay & Forage Industries: *See*—
Herron, Maynard M., 4,944,584, Cl. 198-494.000.

Hayakawa, Kiyoharu: *See*—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.

Hayakawa, Kizo: *See*—
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Teramoto, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, 4,945,487, Cl. 364-474.020.

Hayakawa, Yoichi: *See*—
Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,945,482, Cl. 364-424.100.

Hayashi, Hidechika, to Tosoh Corporation. Quantitative dispenser for a liquid. 4,944,922, Cl. 422-100.000.

Hayashi, Hiroshi: *See*—
Tomiyama, Hideki; Karino, Yukio; and Hayashi, Hiroshi, 4,945,026, Cl. 430-233.000.

Hayashi, Kazuhiko: *See*—
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.

hayashi, Shigeyuki: *See*—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.

Hayashi, Shuji: *See*—
Hara, Fumihiko; Hayashi, Shuji; and Yamada, Genjiro, 4,945,295, Cl. 318-490.000.

Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,945,291, Cl. 315-307.000.

Hayes, Richard A., to Du Pont de Nemours, E. I., and Company. Preparation of poly(phenylene oxide) asymmetric gas separation membranes. 4,944,775, Cl. 55-16.000.

Haylock, John C.: *See*—
Mason, Charles D.; Young, John A.; Haylock, John C.; and Twilley, Ian C., 4,945,129, Cl. 525-66.000.

Headcorn Instrumentation Ltd.: *See*—
Stossel, Clifford A., 4,944,764, Cl. 623-23.000.

Healthscan, Inc.: *See*—
Alvino, Frank J., 4,944,306, Cl. 128-725.000.

Hechtlinger, Solomon L.: *See*—
Gagliano, Francis P.; and Hechtlinger, Solomon L., 4,944,979, Cl. 428-43.000.

Hedges, Winston L.: *See*—
Ghali, Mounir M.; and Hedges, Winston L., 4,945,154, Cl. 528-480.000.

Heflin, Mark S.: *See*—
Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S., 4,944,337, Cl. 141-174.000.

Hefner, Robert E., Jr.; and Robinson, John W., to Dow Chemical Company, The. Styrylaza vinyl esters. 4,945,138, Cl. 525-502.000.

Heilman, William J.: *See*—
DesLauriers, Paul J.; and Heilman, William J., 4,945,017, Cl. 524-111.000.

Heinrichs, Hartmut; Brumsack, Hans-Jurgen; Loftfield, Norman; and Konig, Nils, to Schultz, Wolfgang; Brumsack, Hans-Jurgen; and Loftfield, Norman. Autoclave for the pressure digestion of sample materials in analytical chemistry. 4,944,923, Cl. 422-102.000.

Heinrichs, Heinz-Josef: *See*—
Kortgen, Bernd; Morgen, Helmut; Heinrichs, Heinz-Josef; Fuhrmann, Castor; and Freitag, Herbert, 4,944,498, Cl. 267-64.110.

Hella KG Hueck & Co.: *See*—
Bunse, Wolfgang; Ernst, Hans-Otto; Droste, Heinz; Kalze, Franz-Josef; and Peitz, Wolfgang, 4,945,454, Cl. 362-61.000.

Hella, Terry A.; and Perry, Gary L., to Advance Systems, Inc. High velocity running web dryer having hot air supply means. 4,944,098, Cl. 34-156.000.

Hellings, Gerardus J.: *See*—
Van Der Heijden, Antonius W. F.; Hellings, Gerardus J.; Himmelbauer, Erich E.; Spanjer, Tjerk G.; and Vrijssen, Gerardus A. H. M., 4,945,283, Cl. 313-450.000.

Helma Tegelen B. V.: *See*—
Luyten, Jacobus H., 4,944,339, Cl. 144-363.000.

HEM Research, Inc.: *See*—
Carter, William A., 4,945,082, Cl. 514-44.000.

Henderson, Martin C.; Koerner, Ralph J.; and Jordan, William D., Jr., to Minnesota Mining and Manufacturing Company. Strip material for and a surface mounted inductive loop. 4,945,356, Cl. 340-941.000.

Hendren, Stephen R. Folding tilted bottle holder. 4,944,477, Cl. 248-150.000.

Hendricks, Robert E.: *See*—
Murphy, Kenneth S.; Hendricks, Robert E.; and Fenton, Richard J., 4,944,858, Cl. 204-192.150.

Hendrix, Troy C.: *See*—
Bishop, Robert J.; Fontecchio, Robert P.; Good, Stanley B.; and Hendrix, Troy C., 4,944,527, Cl. 280-741.000.

Hendry, James W., to Ladney, Michael. Method of molding thermoplastic material. 4,944,910, Cl. 264-572.000.

Henkel Corporation: *See*—
Awad, Sami B., 4,944,889, Cl. 252-32.500.
Lindert, Andreas; and Wolpert, Stephen M., 4,944,812, Cl. 148-251.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Krause, Horst-Juergen; Leinen, Hans-Theo; and Lehmann, Rudolf, 4,945,177, Cl. 558-405.000.

Henley Manufacturing Holding Company, Inc.: *See*—
Mills, Jesse V., 4,944,257, Cl. 123-90.340.

Hennequin, James R.; and Fluck, Peter, to Air Muscle Limited. Motorized joint. 4,944,755, Cl. 623-19.000.

Henricson, Kaj; Ryham, Rolf; and Sannholm, Krister, to Ahlstromforetagen Svenska AB. Method and apparatus for evaporating waste liquor produced when cooking fibrous material containing cellulose. 4,944,840, Cl. 162-46.000.

Henry, George K.: *See*—
Deeb, Thomas M.; Henry, George K.; and Bergmann, Heather L., 4,944,890, Cl. 252-54.000.

Hepburn, George R., to Dynasplint Systems, Inc. Adjustable splint. 4,944,290, Cl. 128-87.00R.

Hercules Incorporated: *See*—
Kraus, Wayne A., 4,944,803, Cl. 106-203.000.

Hernandez, Epifanio J.; and Benach, Jose C., to Indiba, S.A. Electronic device for cosmetic and medical therapy. 4,944,302, Cl. 128-422.000.

Hernandez, Pamela K.: *See*—
Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
Rich, Jonathan D.; McDermott, Philip J.; Davis, Gary C.; Policastro, Peter P.; Regh, Karen A.; Hernandez, Pamela K.; and Guggenheim, Thomas L., 4,945,148, Cl. 528-26.000.

Herron, David K.: *See*—
Bollinger, Nancy G.; Goodson, Theodore, Jr.; and Herron, David K., 4,945,099, Cl. 514-381.000.

Herron, Maynard M., to Hay & Forage Industries. Trash discharge apparatus for crop transferring conveyor mechanism. 4,944,384, Cl. 198-494.000.

Hesch, Harold E., to Trinity Industries, Inc. Rail car end assembly. 4,944,234, Cl. 105-378.000.

Hettlage, Eckart; and Ruff, Gerd, to Teldix GmbH. Microwave switch having at least two switching positions. 4,945,320, Cl. 333-106.000.

Hewlett-Packard Company: *See*—
Dion, John H., 4,944,850, Cl. 204-15.000.
Jones, David P.; and Wanger, Mark E., 4,944,082, Cl. 29-467.000.
Naiman, Abraham C., 4,945,351, Cl. 340-793.000.

Hexcel Corporation: *See*—
Ghali, Mounir M.; and Hedges, Winston L., 4,945,154, Cl. 528-480.000.

Heyes, Peter J.; and Middleton, Nicholas J., to CMB Packaging (UK) Limited. Laminated metal sheet. 4,945,008, Cl. 428-623.000.

Hickey, James H.: *See*—
Widmann, Marcel; and Hickey, James H., 4,945,000, Cl. 428-407.000.

Hidaka, Hideto: *See*—
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Yamasaki, Hiroyuki; Konishi Yasuhiro; and Ikeda, Yuto, 4,945,517, Cl. 365-189.010.

Hidaka, Norihiro: *See*—
Nakama, Masato; and Hidaka, Norihiro, 4,945,504, Cl. 364-709.110.

Hiebert, Peter: *See*—
Neilsen, Robert F.; and Hiebert, Peter, 4,944,139, Cl. 53-599.000.

Hieda, Sayuki: *See*—
Nakamura, Masakatsu; and Hieda, Sayuki, 4,945,204, Cl. 219-121.690.

Higashiyama, Shunichi: *See*—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; Hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.

Higgins, George C.: *See*—
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; Brewster, Steven L.; and Higgins, George C., 4,944,999, Cl. 428-371.000.

Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwasa, Kazuyuki; and Nakano, Toshifumi, to Olympus Optical Co., Ltd. Camera. 4,945,372, Cl. 354-199.000.

Hilal, Mohamed A., to General Dynamics Corporation, Convair Division. Magnetic advanced hybrid rail gun. 4,944,212, Cl. 89-8.000.

Hilal, Said S.; and Cooper, Robert P., to Applied Vascular Devices. Device for power injection of fluids. 4,944,726, Cl. 604-143.000.

Hilbert, Bernhard; and Hilt, Gerard, to Gebr. Happich GmbH. Sun visor for motor vehicles. 4,944,549, Cl. 296-97.900.

Hilke, Rainer; and Schmaderer, Gerhard, to A-Z Foremen- und Maschinenbau GmbH. Injector head for producing tread strips. 4,944,666, Cl. 425-131.100.

Hill, Hugh A. O.: *See*—
Forrest, Gordon C.; Rattle, Simon J.; Robinson, Grenville A.; and Hill, Hugh A. O., 4,945,045, Cl. 435-25.000.

Hill, John B.; Dryden, Hugh L., Jr.; and Erickson, Robert, to Nutra Sweet Company, The. Preparation of N-formyl-L-aspartic anhydride. 4,945,172, Cl. 549-253.000.

Hille, Hans-Dieter; Muller, Horst; and Dobbelstein, Arnold, to BASF Lacke & Farben Aktiengesellschaft. Dispersions of crosslinked polymer micro-particles in aqueous media, a process for the preparation of these dispersions, and coating compositions containing these dispersions. 4,945,128, Cl. 524-591.000.

Hilt, Gerard: *See*—
Hilbert, Bernhard; and Hilt, Gerard, 4,944,549, Cl. 296-97.900.

Hilti Aktiengesellschaft: *See*—
Gebauer, Ludwig, 4,944,819, Cl. 156-78.000.

Himmelbauer, Erich E.: *See*—
Van Der Heijden, Antonius W. F.; Hellings, Gerardus J.; Himmelbauer, Erich E.; Spanjer, Tjerk G.; and Vrijssen, Gerardus A. H. M., 4,945,283, Cl. 313-450.000.

Hioki, Takanori: *See*—
Momoki, Yasuhito; Hioki, Takanori; and Okazaki, Masaki, 4,945,038, Cl. 430-576.000.

Hirabayashi, Tsugio: *See*—
Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, 4,944,504, Cl. 271-171.000.

Hirashima, Tsuneaki: *See*—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.

Hirata, Kiminori: *See*—
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.

Hiroki, Keiichiro; Fukasawa, Yukihiko; and Yamauchi, Ken, to Casio Computer Co., Ltd. Power switching arrangement for video camera apparatus. 4,945,424, Cl. 358-335.000.

Hiromoto, Shuji: *See*—
Yoneshige, Yasuo; Misumi, Atsushi; Hiromoto, Shuji; and Sakai, Toru, 4,944,992, Cl. 428-198.000.

Hironaka, Yoshiaki; and Matsumoto, Isao, to Kioritz Corporation. Extendable/retractable operational sleeve. 4,944,711, Cl. 464-52.000.

Hirota, Shingo: *See*—
Tange, Keigo; Kanada, Tomohisa; and Hirota, Shingo, 4,945,388, Cl. 355-296.000.

Hirota, Yoshihiko, to Minolta Camera Kabushiki Kaisha. Color image read apparatus with shading and color balance correction. 4,945,405, Cl. 358-75.000.

Hirschek, Herwig: *See*—
Platzer, Kurt; Hirschek, Herwig; Schaller, Edwin; and Holzinger, Helmut, 4,944,502, Cl. 270-31.000.

Hisamichi, Yasushi; and Miyazaki, Akihiko, to Olympus Optical Co. Ltd. Endoscope still photographing apparatus provided with an automatic illuminating light amount controlling function. 4,945,366, Cl. 354-62.000.

Hitachi, Akio: *See*—
Yui, Yasuji; Hitachi, Akio; Sato, Tatsuru; and Shirakura, Akira, 4,945,382, Cl. 355-27.000.

Hitachi Automotive Engineering Co.: *See*—
Itsuji, Takayuki; Ueno, Sadayasu; and Ichikawa, Norio, 4,944,274, Cl. 123-489.000.

Hitachi Device Engineering Co.: *See*—
Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, 4,945,506, Cl. 364-736.000.

Hitachi Device Engineering Co., Ltd.: *See*—
Tojo, Toshio, 4,944,706, Cl. 445-8.000.

Hitachi, Ltd.: *See*—
Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, 4,945,506, Cl. 364-736.000.
Fukinuki, Takahiko, 4,945,402, Cl. 358-12.000.
Ibamoto, Masahiko; Shimada, Satoshi; Ohyama, Shinji; Sato, Manabu; Kuzunuki, Soshiro; and Kano, Mitsunari, 4,945,348, Cl. 340-784.000.
Iizuka, Tadashi; Fukuda, Kazushi; Ishihara, Shin; Kamitsuma, Yasuo; and Nakagawa, Yusaku, 4,944,663, Cl. 418-178.000.
Kashiyama, Masamori, 4,945,516, Cl. 365-189.050.
Kawamura, Hiromitsu; Kawamura, Takao; Kobara, Katsumi; and Endo, Yoshishige, 4,945,282, Cl. 313-479.000.
Kawasaki, Takeshi; Endo, Junji; Isakozawa, Shigeto; Tomita, Masahiro; and Tonomura, Akira, 4,945,247, Cl. 250-423.00F.
Nibei, Hideki; Miyashita, Kunio; and Asano, Hideki, 4,945,268, Cl. 310-12.000.
Shii, Kazuo; Ohashi, Toshiyuki; and Kobayashi, Hiroyuki, 4,945,237, Cl. 250-311.000.
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.
Takahashi, Hideo, 4,945,470, Cl. 364-200.000.
Tojo, Toshio, 4,944,706, Cl. 445-8.000.
Ueda, Ken; Umetani, Keiji; and Suzuki, Yoshio, 4,945,552, Cl. 378-99.000.
Yamakido, Kazuo, 4,945,359, Cl. 341-143.000.

Hitachi, Ltd: *See*—
Itsuji, Takayuki; Ueno, Sadayasu; and Ichikawa, Norio, 4,944,274, Cl. 123-489.000.

Hitachi Metals, Ltd.: *See*—
Ueda, Seitaro; Okubo, Yukio; Izumi, Shinichiro; and Hoshiro, Takeshi, 4,944,715, Cl. 474-245.000.
Yamauchi, Kiyotaka; and Yoshizawa, Yoshihito, 4,945,339, Cl. 340-551.000.

Hitec Products, Inc.: *See*—
Wnuk, Vincent P., 4,944,181, Cl. 73-780.000.

Hjalmarsson, Lennart, to ABB Stal AB. Method and a device for cooling of a PFBC power plant after a gas turbine trip. 4,944,148, Cl. 60-39.020.

Ho, Cecil T.: *See*—
Davis, Donald E.; Ho, Cecil T.; Lieberman, Jon E.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,945,246, Cl. 250-492.200.

Ho, Ou-Yang C.: *See*—
Feng, Ou-Yang; and Ho, Ou-Yang C., 4,944,656, Cl. 116-173.000.

Ho, S. Winston; Sartori, Guido; Thaler, Warren A.; and Dalrymple, David C., to Exxon Research and Engineering Company. Polyimide/aliphatic polyester copolymers. 4,944,880, Cl. 210-640.000.

Hobart Corporation: *See*—
Treiber, Fritz F., 4,944,135, Cl. 53-502.000.

Hobbs, Simon H.; and Gosling, Christopher D., to UOP. Dehydrocyclodimerization process start-up procedure. 4,945,175, Cl. 585-417.000.

Hodson, Simon. Apparatus for producing cement building material. 4,944,595, Cl. 366-65.000.

Hoechst AG: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, 4,945,004, Cl. 428-469.000.

Hoechst Aktiengesellschaft: *See*—
Grablev, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, 4,945,108, Cl. 514-475.000.

Stenger, Karl; Strutzel, Hans; and Crass, Guenther, 4,944,970, Cl. 428-34.800.
Hoechst Celanese Corp.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,944,895, Cl. 252-299.010.
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,944,896, Cl. 252-587.000.
Sagong, Geon; Newnham, Robert E.; Safari, Ahmad; and Jang, Sei-Joo, 4,944,891, Cl. 252-62.900.
Wilczak, Wojciech A., 4,945,027, Cl. 430-281.000.
Hoesch Aktiengesellschaft: *See*—
Blumbach, Gotz-Peter; Brueckner, Willi; and Mueller, Rudolf, 4,944,080, Cl. 29-33.00A.
Hoffgen, Hans: *See*—
Grabner, Bernd; Dotsch, Lorenz; Knauder, Josef; and Hoffgen, Hans, 4,944,497, Cl. 266-268.000.
Hoffman, Fred: *See*—
Lautner, Max; Hoffman, Fred; and Melnikov, Edward, 4,944,085, Cl. 29-732.000.
Hoffman, Lewis, deceased: *See*—
Friesen, G. Delbert; Shin, Yun K.; and Hoffman, Lewis, deceased, 4,945,071, Cl. 501-41.000.
Hoffman, Norma, Executrix: *See*—
Friesen, G. Delbert; Shin, Yun K.; and Hoffman, Lewis, deceased, 4,945,071, Cl. 501-41.000.
Hoffman, Robert W., to Revlon, Inc. Conical spiral antenna. 4,945,363, Cl. 343-895.000.
Hofmann, Heinrich: *See*—
Ankenbauer, Gerhard; and Hofmann, Heinrich, 4,944,611, Cl. 384-476.000.
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, to Schering Aktiengesellschaft. Estrane and androstane derivatives, process for producing them and preparations containing these compounds. 4,945,064, Cl. 436-503.000.
Hogan, Dennis L., to Security Tag Systems, Inc. Detrimental-substance-containing theft-deterrent device. 4,944,075, Cl. 24-704.100.
Hogan, Mark R.: *See*—
Chou, S.-T. Rudy; and Hogan, Mark R., 4,944,654, Cl. 415-211.200.
Holbrook, Gerald L.: *See*—
Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., 4,944,200, Cl. 74-867.000.
Hollen, Zdenek T.: *See*—
Jansen, Gerardus L. M.; Grassens, Leonardus J.; and Hollen, Zdenek T., 4,945,526, Cl. 369-44.110.
Holstein und Kappert AG: *See*—
Zodrow, Rudolf; Rogall, Wolfgang; Hoveler, Egon; and Buchholz, Rainer, 4,944,830, Cl. 156-567.000.
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Hull, Harold L.; and Newton, Thomas D. Combination match safe, knife and striker. 4,944,392, Cl. 206-102.000.
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Itsuji, Takayuki; Ueno, Sadayasu; and Ichikawa, Norio, 4,944,274, Cl. 123-489.000.
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ICI Americas Inc.: *See—*
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Wee, Siok-Hui H., 4,944,796, Cl. 71-118.000.
Ide, Kenzi: *See—*
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Ide, Motoki: *See—*
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Ideta, Yorihiko, to NEC Corporation. Multicolor ink ribbon switching system for printer. 4,944,618, Cl. 400-211.000.
Igata, Toyonori, to Pioneer Electronic Corporation. Compact optical pickup apparatus for optical disk player. 4,945,524, Cl. 369-44.110.
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Hardy, Donald P., Jr.; and Parker, Eric C., 4,944,523, Cl. 280-689.000.
Imai, Akira, to AMP Incorporated. Electrical connector for flat electrical cables. 4,944,690, Cl. 439-492.000.
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Peschmann, Kristian R.; and Shen, Steve S., 4,944,448, Cl. 228-173.200.
Imoehl, William J., to Siemens-Bendix Automotive Electronics L.P. Accelerating pedal for electronic throttle actuation system. 4,944,269, Cl. 123-399.000.
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Inada, Kuniaki: *See—*
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Inagaki, Yoshio: *See—*
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Molina, Richard W.; Cortina, Manuel; Bertolina, Roberto; and Balsa, Luis H., 4,944,262, Cl. 123-190.08D.
Inax Corporation: *See—*
Sakakibara, Kohei; Masuoka, Kanetaro; and Fukushima, Toshio, 4,944,330, Cl. 137-625.310.
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Baldwin, Stanley L.; and Berscheid, Charles W., 4,944,325, Cl. 137-375.000.
Indiba, S.A.: *See—*
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Indspec Chemical Corporation: *See—*
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Ing. Erich Pfeiffer GmbH & Co. KG: *See—*
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Injectall Limited: *See—*
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Innis, Charles L., Jr.: *See—*
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Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,944,799, Cl. 75-501.000.
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Elliott, Linda C.; Horn, Gary R.; Jordan, Lloyd E., II; Levine, Frank E.; Shih, Cheng-Fong; and Myre, William W., Jr., 4,945,474, Cl. 364-200.000.
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Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.
Boigenzahn, Jeffrey F.; Bratvold, Darrell E.; Rigotti, James M.; and Tufty, Lyle R., 4,945,435, Cl. 360-106.000.
Brown, Michael B.; Ebert, William S.; Olson, Leonard T.; and Sloma, Richard R., 4,945,399, Cl. 357-74.000.
Carson, Mark E.; and Johri, Abhai, 4,945,468, Cl. 364-200.000.
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Cronin, John E.; Cronin, Susan F.; Kaasta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., 4,944,682, Cl. 437-192.000.
Cunningham, Earl A., 4,945,427, Cl. 360-75.000.
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Patel, Arvind M., 4,945,538, Cl. 371-43.000.
Waldo, Ellen J., 4,945,428, Cl. 360-92.000.

Interpatents Ltd.: *See*—
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Link, Helmut D.; and Keller, Arnold, 4,944,762, Cl. 623-23.000.

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Iowa State University Research Foundation, Inc.: *See*—
Lockridge, James E.; and Fritz, James S., 4,944,878, Cl. 210-683.000.

Ipcinski, Ralph, to C & K Components, Inc. Rotary switch. 4,945,195, Cl. 200-6.00B.

Ipsco Enterprises, Inc.: *See*—
Zimmer, James M.; and Bailey, William D., 4,944,814, Cl. 148-329.000.

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Ishida, Ryuji; and Kiuchi, Toyoo, to NEC Corporation. Overflow correction circuit. 4,945,507, Cl. 364-737.000.

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Ishikawa, Kenichi; Kurita, Koji; Fukawa, Satoru; and Maeda, Kenji, to Asahi Glass Company Ltd. Method for press-bonding laminated assembly. 4,944,822, Cl. 156-212.000.

Ishikawa, Tadashi: *See*—
Suzuki, Koji; Nagahira, George; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,945,255, Cl. 307-17.000.

Ishikawa, Takashi; Oshimura, Nobumitsu; and Ohmori, Kenji, to Sumitomo Metal Mining Co. Ltd. Process for preparing powder of an alloy of a rare earth element, iron and boron for a resin bonded magnet. 4,944,801, Cl. 75-349.000.

Ishimura, Toshihiko: *See*—
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Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Ishimura, Toshihiko; and Katayori, Sinji, 4,945,370, Cl. 354-173.110.

Ishino, Tokio; Sato, Atsushi; and Demura, Motokuni, to Ricoh Company, Ltd. Camera with built-in electronic flash. 4,945,368, Cl. 354-149.110.

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Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.

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Itami, Hideo: *See*—
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Ito, Isao: *See*—
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Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.

Ito, Masazumi; and Horie, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Copier with magnification selection and paper winding prevention. 4,945,386, Cl. 355-243.000.

Ito Optical Industrial Co., Ltd.: *See*—
Furuta, Shoichiro; Kato, Hirohisa; and Seto, Hirohito, 4,944,962, Cl. 427-164.000.

Ito, Roy A.; and Kuo, Wen-Tar, to Pertron Controls Corporation. Rack mountable weld controller. 4,945,201, Cl. 219-110.000.

Ito, Shinichi: *See*—
Shigekane, Hisao; and Ito, Shinichi, 4,945,396, Cl. 357-46.000.

Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, to Kao Corporation. Novel alkaline cellulases and a microorganism for producing the same. 4,945,053, Cl. 435-209.000.

Ito, Takashi: *See*—
Nakajima, Masato; and Ito, Takashi, 4,944,189, Cl. 73-861.250.

Ito, Yoshio, to Tabai Espec Corporation. Filtering device. 4,944,125, Cl. 52-171.000.

Itoh, Hisatsugu; and Kawabata, Munehiro, to Mitsubishi Denki Kabushiki Kaisha. Trouble detection apparatus for automobile air-bag system. 4,945,336, Cl. 340-438.000.

Itomitsu, Fujio; and Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Improved pipelined processor with two stage decoder for exchanging register values for similar operand instructions. 4,945,511, Cl. 364-900.000.

Itsuji, Takayuki; Ueno, Sadayasu; and Ichikawa, Norio, to Hitachi, Ltd; and Hitachi Automotive Engineering Co. Air-fuel ratio control apparatus for internal combustion engines. 4,944,274, Cl. 123-489.000.

Iturzaeta, Richard F.: *See*—
Oleson, John C.; Teske, Steven K.; Iturzaeta, Richard F.; and Langer, Erwin E., 4,944,647, Cl. 414-412.000.

IVAC Corporation: *See*—
Daoud, Adib G.; and Bacher, Fred W., 4,944,485, Cl. 251-9.000.

Iwahashi, Kenji: *See*—
Makabe, Hideki; and Iwahashi, Kenji, 4,945,551, Cl. 378-34.000.

Iwahashi, Yuji; Urayama, Kiyoshi; and Sato, Shinya, to Sony Corporation. Tape cassette with transparent reel viewing windows and laminated three-color construction. 4,945,440, Cl. 360-132.000.

Iwaki, Yoshiyuki: *See*—
Ochi, Daisuke; Yoshida, Yasuhiro; and Iwaki, Yoshiyuki, 4,945,272, Cl. 310-91.000.

Iwakura, Syuji: *See*—
Akutsu, Mitsuo; Iwakura, Syuji; and Oya, Keiji, 4,944,980, Cl. 426-64.000.

Iwamoto, Yasuaki: *See*—
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,945,022, Cl. 430-120.000.

Iwasa, Kazuyuki: *See*—
Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwasa, Kazuyuki; and Nakano, Toshifumi, 4,945,372, Cl. 354-199.000.

Iwasaki, Katsuhiro: *See*—
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,944,799, Cl. 75-501.000.

Iwata, Hirokimi: *See*—
Suzuki, Masayuki; and Iwata, Hirokimi, 4,945,433, Cl. 360-99.070.

Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Method of and apparatus for separating a balloon in a balloon catheter. 4,944,746, Cl. 606-195.000.

Iwata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Safety device for elevator. 4,944,369, Cl. 187-[illegible].000.

Iwata, Toshio; and Ohkubo, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Controller for internal combustion engine. 4,944,271, Cl. 123-435.000.

Iwatani Sangyo Kabushiki Kaisha: *See*—
Kajino, Hideo; and Matsuo, Kazuo, 4,944,324, Cl. 137-113.000.

Iwatani, Shiro; and Kitamura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Control device for a vehicle A.C. generator. 4,945,277, Cl. 340-455.000.

Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, to Toyota Jidosha Kabushiki Kaisha. System for integrally controlling automatic transmission and engine. 4,945,481, Cl. 364-424.100.

IWC International Watch Co. AG: *See*—
Klaus, Kurt, 4,945,521, Cl. 368-21.000.

Izumi, Fumiaki: *See*—
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.

Izumi, Shinichiro: *See*—
Ueda, Seitaro; Okubo, Yukio; Izumi, Shinichiro; and Hoshiro, Takeshi, 4,944,715, Cl. 474-245.000.

J.D.'s: *See*—
Datlow, David, 4,944,417, Cl. 211-184.000.

J. Eberspacher: *See*—
Mayer, Wolfgang, 4,944,661, Cl. 417-501.000.

J. Kohle GmbH & Co. KG: *See*—
Haug, Reinhold, 4,944,073, Cl. 24-590.000.

J. M. Voith GmbH: *See*—
Elsner, Ernst, 4,944,377, Cl. 192-56.00F.
Flamig, Hans; Schutte, Andreas; Schiel, Christian; Steiner, Karl; and Mullner, Josef, 4,944,089, Cl. 29-895.220.

Jackson, J. R.: *See*—
Jackson, John R., 4,945,310, Cl. 324-349.000.

Jackson, John R., to Jackson, J. R.; and Arismendi, A. M., Jr. Passive geophysical survey method based upon the detection of the DC

component of the vertical electrical potential of natural earth currents. 4,945,310, Cl. 324-349.000.
Jackson, Raymond T., to Cableware Pty. Ltd. Bus system. 4,945,188, Cl. 174-16.200.
Jacob, Werner. Revolving guiding means for rolling members. 4,944,607, Cl. 384-44.000.
Jacobs, Thomas G. M.; and De Vroome, Clemens J. M., to Stork Contiweb B.V. Drier for a web of material. 4,944,673, Cl. 432-59.000.
Jacobsen, Finn; and Richter, Ole J., to Kamyr AB. Backflushing pressure diffuser screens. 4,944,167, Cl. 68-181.00R.
Jacques, Guionnet: *See*—
Christian, Victorion; and Jacques, Guionnet, 4,945,564, Cl. 380-14.000.
Jacuzzi, Inc.: *See*—
Wilkes, Robert D., 4,944,653, Cl. 415-174.300.
Jaeger, Scott H.: *See*—
Clemow, Alastair J. T.; Jaeger, Scott H.; and Ritchie, Allan, 4,944,742, Cl. 606-59.000.
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Fungicidal novel hydroxyalkynyl-azolyl derivatives. 4,945,101, Cl. 514-383.000.
Jahnke, Eitelfriedrich; and Hansel, Detlef, to Gesika Buromobelwerk GmbH & Co. KG. Attachment mechanism for attaching a desk top to a support structure. 4,944,235, Cl. 108-157.000.
Jameson Corporation: *See*—
Crates, James M., 4,945,461, Cl. 362-378.000.
Jameson, Richard J.: *See*—
Brockschmidt, Arthur E., Jr.; and Jameson, Richard J., 4,945,442, Cl. 361-56.000.
Jamison, Charles E.: *See*—
Felton, Clinton D.; Gibson, Baylor D.; Jamison, Charles E.; McWhorter, William O.; and Serad, George A., 4,944,854, Cl. 204-168.000.
Jang, Sei-Joo: *See*—
Sagong, Geon; Newnham, Robert E.; Safari, Ahmad; and Jang, Sei-Joo, 4,944,891, Cl. 252-62.900.
Jang, Won-Hee: *See*—
Kang, Myong-Ku; Park, Byong-Hyun; and Jang, Won-Hee, 4,945,066, Cl. 437-30.000.
Jansen, Christian J., Jr. Safe oral folic-acid-containing vitamin preparation. 4,945,083, Cl. 514-52.000.
Jansen, Gerardus L. M.; Grassens, Leonardus J.; and Hollen, Zdenek T., to Laser Magnetic Storage International Company. Actuator assembly for optical disk systems. 4,945,526, Cl. 369-44.110.
Janum, Viggo K., to Scantest Systems A/S. Process and a circuit board for performing tests during burn-in of integrated semi-conductor circuits. 4,945,302, Cl. 324-73.100.
Japan Storage Battery Company Limited: *See*—
Tanaka, Masafumi, 4,945,011, Cl. 429-81.000.
Jaron, Michael: *See*—
Goldberg, Edward M.; Melinyshyn, Lev; Jaron, Michael; and Stupar, Jeffrey M., 4,944,724, Cl. 604-118.000.
Jarrett, William E., to Jarrett, William E.; and Vollink, Dan H. Wall mounted clothes hanger. 4,944,480, Cl. 248-309.100.
Jasek, Anthony B.: *See*—
Griesbaum, Theodore J.; Lydic-Mettler, Joan S.; Flores, Pamela A.; Jasek, Anthony B.; and Wrzesinski-Conran, Mary A., 4,944,556, Cl. 297-437.000.
Jay, Jerry L., Sr.; and Cottrell, Ben. Process and apparatus for separating plastics from contaminants. 4,944,868, Cl. 209-10.000.
Jean, Lisa. Fishing float. 4,944,113, Cl. 43-43.140.
Jean Walterscheid GmbH: *See*—
Langen, Hans; Fartmann, Norbert; and Coenen, Herbert, 4,944,354, Cl. 172-47.000.
Jenekhe, Samson A.; and Peterson, James R., to Honeywell Inc. Solution processing of rigid chain and ladder polymers. 4,945,156, Cl. 528-485.000.
Jenkins, Thomas E.; and Beers, David G., to General Electric Company. Refrigerator freezer compartment floor covering assembly. 4,944,157, Cl. 62-407.000.
Jennings, Matthew G. Eyeglass shading device. 4,944,583, Cl. 351-45.000.
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter, to Bayer Aktiengesellschaft. Pest-combating agents based on pyrazole derivatives. 4,945,165, Cl. 548-362.000.
Jeol Ltd.: *See*—
Mogami, Akinori; and Naitoh, Motohiro, 4,945,236, Cl. 250-309.000.
Jerenz, Hans, to Felix Schoeller Jr. GmbH & Co. KG. Process for the hardening of photographic gelatin coatings and a composite hardener for gelatin-containing coatings. 4,944,966, Cl. 427-397.000.
Jerina, Frank J.: *See*—
Balzkin, Richard F.; Reiss, John R.; and Jerina, Frank J., 4,944,564, Cl. 303-33.000.
Jespersen, Paul W., to Georgia-Pacific Corporation. Flexible sheet material dispenser with automatic roll transferring mechanism. 4,944,466, Cl. 242-55.300.
Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Ohta, Kenji; and Ohashi, Yasuo, 4,944,375, Cl. 192-8.00R.
Joco, Fidel M., to Allied-Signal Inc. Embedded nut compressor wheel. 4,944,660, Cl. 417-407.000.
Jodel Medical Products, Inc.: *See*—
Eldridge, John D., Jr.; and Morgan, Mary A., 4,944,311, Cl. 128-849.000.
John Siemiarowski: *See*—
Stahl, Ira R., 4,944,472, Cl. 242-129.000.
Johns, Robert H.; and Rzomp, J. Richard, to Allegheny Ludlum Corporation. Method and apparatus for leveling a refractory bed surface. 4,944,495, Cl. 266-100.000.
Johnson, Bertrand H.: *See*—
Blonder, Greg E.; and Johnson, Bertrand H., 4,945,400, Cl. 357-74.000.
Johnson & Johnson Orthopaedics, Inc.: *See*—
Clemow, Alastair J. T.; Jaeger, Scott H.; and Ritchie, Allan, 4,944,742, Cl. 606-59.000.
Johnson, Michael H.: *See*—
Richard, Bennett M.; and Johnson, Michael H., 4,944,347, Cl. 166-278.000.
Johnson, Paul E. Nut splitting device. 4,944,091, Cl. 30-120.200.
Johnson, Richard H. Container and dispenser of coins. 4,944,391, Cl. 206-0.830.
Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,944,797, Cl. 420-469.000.
Johnston, James P.: *See*—
Leebeek, Antonius C. G.; and Johnston, James P., 4,944,165, Cl. 68-17.00R.
Johri, Abhai: *See*—
Carson, Mark E.; and Johri, Abhai, 4,945,468, Cl. 364-200.000.
Joint Medical Products Corporation: *See*—
Mallory, Thomas H.; McTighe, Timothy; and Noiles, Douglas G., 4,944,759, Cl. 623-22.000.
Jolidon, Francois; and Richard, Willy, to Relhor S.A. Device for lifting a time ban on the actuation of a mechanism in a conditional-opening locking system in the event of a breakdown. 4,944,170, Cl. 70-267.000.
Jones, David P.; and Wanger, Mark E., to Hewlett Packard Co. Method of providing a sheet metal housing with precisely positioned mounting references. 4,944,082, Cl. 29-467.000.
Jones, Kenneth A.: *See*—
Buckberg, Gerald D.; Maloney, James V., Jr.; Jones, Kenneth A.; and West, Weldon D., 4,944,729, Cl. 604-164.000.
Jones, Laurence W., to Kooragang Coal Management Pty. Ltd. Speed indication system. 4,944,474, Cl. 246-122.00R.
Jones, Raymond, to C&K Components, Inc. Telemetry system used with sensing devices. 4,945,353, Cl. 340-825.070.
Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 4,945,106, Cl. 514-469.000.
Jones, Robin; and Ridley, Kevin D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Avalanche photodiode quenching circuit. 4,945,227, Cl. 250-214.00R.
Jordan, Johnny. Golf club washer. 4,944,063, Cl. 15-104.920.
Jordan, Lloyd E., II: *See*—
Elliott, Linda C.; Horn, Gary R.; Jordan, Lloyd E., II; Levine, Frank E.; Shih, Cheng-Fong; and Myre, William W., Jr., 4,945,474, Cl. 364-200.000.
Jordan, William D., Jr.: *See*—
Henderson, Martin C.; Koerner, Ralph J.; and Jordan, William D., Jr., 4,945,356, Cl. 340-941.000.
Jorro, Robert V. J., to Western Atlas International, Inc. Calibration and quality control system for neutron logging instruments. 4,945,233, Cl. 250-252.100.
Jos. Dyson & Sons, Inc.: *See*—
Robb, Frank B., 4,944,633, Cl. 405-3.000.
Joseph, Evelyne L.: *See*—
Legoux, Richard; Leplatois, Pascal; Joseph, Evelyne L.; Niaudet, Brigitte; and Roskam, Willem, 4,945,047, Cl. 435-69.400.
Jouillat, Claude, to S.T.E.P. Apparatus for facilitating the filling of spray devices. 4,944,432, Cl. 222-321.000.
Joy Technologies Inc.: *See*—
Osterwise, George A., 4,944,560, Cl. 299-91.000.
Jozefowicz, Marcel: *See*—
Fougnot, Christine; Jozefowicz, Marcel; and Rosenberg, Robert D., 4,945,054, Cl. 435-214.000.
Jung, Harald: *See*—
Langen, Gunter; and Jung, Harald, 4,944,958, Cl. 427-2.000.
Jung, Johann: *See*—
Rentzea, Costin; Rademacher, Wilhelm; Jung, Johann; and Harreus, Albrecht, 4,944,789, Cl. 71-88.000.
Jungo, Charles: *See*—
Gamgee, Christopher J.; Leigh-Jones, Peter; and Jungo, Charles, 4,945,225, Cl. 250-214.00B.
Junker, Warren R.: *See*—
Clark, William G., Jr.; and Junker, Warren R., 4,944,185, Cl. 73-579.000.
Jurczak, Jeffrey T.: *See*—
Chambers, Warren D.; and Jurczak, Jeffrey T., 4,944,370, Cl. 188-71.500.
Juvinall, John W.; and Ringlien, James A., to Owens-Illinois Glass Container Inc. Inspection of container finish. 4,945,228, Cl. 250-223.00B.
Kaanta, Carter W.: *See*—
Cronin, John E.; Cronin, Susan F.; Kaanta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., 4,944,682, Cl. 437-192.000.

Kabachinski, Jeffery L.; and Fetter, Richard W., to Labthermics Technologies, Inc. Low frequency isolator for radio frequency hyperthermia probe. 4,945,318, Cl. 333-12.000.

KabiVitrum AB: *See*—
Labbe, Jean-Marie; Damhuis, Eduard H. J.; and Cox, Robert E. L., 4,944,659, Cl. 417-322.000.

Kabushiki Kaisha Asano Kenkyusho: *See*—
Asano, Kazuo; Takai, Toshihiso; and Takito, Mitsuake, 4,944,668, Cl. 425-397.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Kitano, Seiichi; Asada, Masaaki; and Masaki, Michitomo, 4,944,380, Cl. 192-89.00B.
Tijima, Hiromi, 4,944,499, Cl. 267-154.000.

Kabushiki Kaisha Ishikawa Seisakusho, Ltd.: *See*—
Kato, Tadao; Yamagiwa, Akira; and Matsuoka, Eiichi, 4,944,144, Cl. 57-105.000.

Kabushiki Kaisha Itoki Kosakusho: *See*—
Konishi, Masao; and Tsuchida, Shigeki, 4,945,430, Cl. 360-92.000.

Kabushiki Kaisha Nikken: *See*—
Hara, Fumihiko; Hayashi, Shuji; and Yamada, Genjiro, 4,945,295, Cl. 318-490.000.

Kabushiki Kaisha Okawara Seisakusho: *See*—
Kobayashi, Masaru; and Kawai, Sumio, 4,944,874, Cl. 210-232.000.

Kabushiki Kaisha Sankyo Seiko Seisakusho: *See*—
Oguchi, Yuzo; Komatsu, Fumito; and Iizawa, Motohiro, 4,945,437, Cl. 360-106.000.

Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, 4,944,746, Cl. 606-195.000.

Kabushiki Kaisha Toshiba: *See*—
Harigae, Masatoshi, 4,944,587, Cl. 356-152.000.
Maeda, Ken-ichi; Saito, Mitsuo; Aikawa, Takeshi; Matoba, Tsukasa; and Okamura, Mitsuyoshi, 4,945,510, Cl. 364-900.000.
Muramatsu, Kunio; and Suzuki, Seigo, 4,945,518, Cl. 365-233.000.
Oda, Goro; Nagata, Niro; Nakatomi, Yoshitsugu; Sawafuji, Takashi; Shinozaki, Yoshihisa; and Goto, Eizo, 4,944,786, Cl. 65-154.000.
Sato, Tutomu; Yura, Haruhiko; Nasu, Yoshihiko; Fujiwara, Atsumi; and Mori, Shigeo, 4,945,317, Cl. 330-301.000.
Shimoma, Taketoshi; Koshigoe, Shinpei; and Hasegawa, Takahiro, 4,945,284, Cl. 313-414.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Teramoto, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, 4,945,487, Cl. 364-474.020.

Kabushiki Kaisha Yagishita: *See*—
Yagishita, Aisaburo; Iriyama, Yasunori; and Osuga, ouichiro, 4,944,870, Cl. 210-103.000.

Kabushiki Kaisha Yakult Honsha: *See*—
Kobayashi, Yoichi; Kan, Tatsuhiko; and Terashima, Tsuneo, 4,944,952, Cl. 426-42.000.

Kadel Eagineering Corporation: *See*—
Alexander, David K., 4,944,155, Cl. 62-45.100.

Kagawa, Kazuo: *See*—
Arai, Naoki; and Kagawa, Kazuo, 4,945,036, Cl. 430-567.000.

Kagawa, Seiji; Toda, Hideaki; and Nomura, Shinichiro, to Tonen Sekiyukagaku Kabushiki Kaisha. Polymer composition, its heat-resistant, shape memory formed product and method of producing same. 4,945,127, Cl. 524-524.000.

Kahnau, Guenter: *See*—
Widemann, Friedrich; Kahnau, Guenter; Kohse, Richard; and Raethel, Dieter, 4,944,454, Cl. 237-12.30C.

Kajaani Elektroniikka Oy: *See*—
Sjostrom, Eero; and Raimo, Alen, 4,944,841, Cl. 162-49.000.

Kajino, Hideo; and Matsuo, Kazuo, to Iwatani Sangyo Kabushiki Kaisha; and Central Sekiyu Gas Kabushiki Kaisha. Fuel gas supply equipment with abnormal offensive odor suppressing filter. 4,944,324, Cl. 137-113.000.

Kajita, Hideo: *See*—
Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Ishimura, Toshihiko; and Katayori, Sinji, 4,945,370, Cl. 354-173.110.

Kakidaira, Susumu, to Koito Manufacturing Co., Ltd. High-mounted stoplight for motor vehicle. 4,945,456, Cl. 362-80.100.

Kakinuma, Yuji: *See*—
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 4,945,215, Cl. 235-457.000.

Kallies, Guenter; and Lesat-Kaupat, Wolfgang, to Messerschmitt-Boelkow-Blohm GmbH. Locking mechanism for an aircraft door. 4,944,473, Cl. 244-129.500.

Kalstroem, Reiner; and Schulz-DuBois, Erich, to Dr. Ing. Rudolf Hell GmbH. Volume-measuring method for surface depressions. 4,944,593, Cl. 356-379.000.

Kaltenbach & Voight GmbH & Co.: *See*—
Lang, Hans-Walter; and Straka, Alfred, 4,944,680, Cl. 434-264.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Lohn, Gerd, 4,944,675, Cl. 433-32.000.

Kalze, Franz-Josef: *See*—
Bunse, Wolfgang; Ernst, Hans-Otto; Droste, Heinz; Kalze, Franz-Josef; and Peitz, Wolfgang, 4,945,454, Cl. 362-61.000.

Kamba, Masaru: *See*—
Inoue, Yasuo; Kikkawa, Masanari; Kamba, Masaru; and Okuda, Hiroshi, 4,944,178, Cl. 73-19.100.

Kamegaya, Shigeru: *See*—
Matayoshi, Yutaka; Nakagawa, Yasuhiko; Hamai, Kyugo; and Kamegaya, Shigeru, 4,944,256, Cl. 123-90.240.

Kamitsuma, Yasuo: *See*—
Iizuka, Tadashi; Fukuda, Kazushi; Ishihara, Shin; Kamitsuma, Yasuo; and Nakagawa, Yusaku, 4,944,663, Cl. 418-178.000.

Kamm, Lawrence J., to Science Applications International Corporation. Reciprocating electromagnetic actuator. 4,945,269, Cl. 310-15.000.

Kamyr AB: *See*—
Jacobsen, Finn; and Richter, Ole J., 4,944,167, Cl. 68-181.00R.

Kamyr, Inc.: *See*—
Stromberg, C. Bertil; Phillips, Joseph R.; and Torregrossa, Louis O., 4,944,842, Cl. 162-60.000.

Kan, Tatsuhiko: *See*—
Kobayashi, Yoichi; Kan, Tatsuhiko; and Terashima, Tsuneo, 4,944,952, Cl. 426-42.000.

Kanada, Tomohisa: *See*—
Tange, Keigo; Kanada, Tomohisa; and Hirota, Shingo, 4,945,388, Cl. 355-296.000.

Kancel, Michael A.: *See*—
Driscoll, John L.; Law, Edward K. H.; Masson, Gerald M.; Coraluppi, Giorgio L.; and Kancel, Michael A., 4,945,534, Cl. 370-62.000.

Kandatsu, Kiyoshi, to Fuji Electric Co., Ltd. Circuit breaker. 4,945,326, Cl. 335-16.000.

Kaneko, Kiyotaka, to Fuji Photo Film Co., Ltd. Zero-cross point detecting circuit. 4,945,441, Cl. 360-137.000.

Kaneko, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Gate circuit for bus signal lines. 4,945,540, Cl. 371-57.100.

Kaneuchi, Kunihiro; Kawamoto, Toshiki; and Nakatani, Tomofumi, to Ricoh Company, Ltd. Voice activated dialing apparatus. 4,945,557, Cl. 379-67.000.

Kang, Dongmin, to Korea Measures Co., Ltd. Measuring tape with light. 4,944,097, Cl. 33-760.000.

Kang, Myong-Ku; Park, Byong-Hyun; and Jang, Won-Hee, to Sam-Sung Electronics Co., Ltd. Process for manufacturing a dynamic random access memory cell. 4,945,066, Cl. 437-30.000.

Kangas, Martti Y. O.: *See*—
Sundholm, Patrick J.; Donnelly, Robert H.; and Kangas, Martti Y. O., 4,944,960, Cl. 427-27.000.

Kano, Mitsunari: *See*—
Ibamoto, Masahiko; Shimada, Satoshi; Ohyama, Shinji; Sato, Manabu; Kuzunuki, Soshiro; and Kano, Mitsunari, 4,945,348, Cl. 340-784.000.

Kastor, Frederick W. Apparatus and method for containing and processing liquids and wastes. 4,944,872, Cl. 210-170.000.

Kanzaki Paper Mfg.: *See*—
Tanaka, Kenmei, 4,944,614, Cl. 400-68.000.

Kanzaki Paper Manufacturing Company, Limited: *See*—
Yagi, Hisanori; Hamada, Kousuke; Nakano, Isamu; Nishimura, Yoshihiro; Matsubayashi, Hajime; and Tani, Hisashi, 4,944,959, Cl. 427-14.100.

Kao Corporation: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.

Kapmeyer, Wolfgang; and Rinno, Helmut, to Behringwerke Aktiengesellschaft. Dispersion polymers processes for their preparation and their use. 4,945,146, Cl. 526-304.000.

Kappe, Rudolf A.: *See*—
Adams, Horst H.; Bruggestrath, Bernd; and Kappe, Rudolf A., 4,944,489, Cl. 251-306.000.

Kar, Naresh J.: *See*—
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,944,774, Cl. 51-309.000.

Karas, Bradley R.; and Powers, Robert W., to Electric Power Research Institute. Formation of alumina impregnated carbon fiber mats. 4,944,991, Cl. 428-408.000.

Karas, Lawrence J.: *See*—
Grey, Roger A.; Karas, Lawrence J.; and Verkruyse, Linda A., 4,944,346, Cl. 166-274.000.

Karchewski, John, to Brandt Industries, Ltd. Caster wheel control apparatus. 4,944,355, Cl. 172-278.000.

Karino, Yukio: *See*—
Tomiyama, Hideki; Karino, Yukio; and Hayashi, Hiroshi, 4,945,026, Cl. 430-233.000.

Karl Otto Braun KG: *See*—
Langen, Gunter; and Jung, Harald, 4,944,958, Cl. 427-2.000.

Karl Thomae GmbH: *See*—
Muller, Klaus R., 4,945,187, Cl. 568-868.000.

Kashihara, Yuji: *See*—
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.

Kashima, Mitsuhiro; and Hanawa, Nobumichi, to Kayaba Kogyo Kabushiki Kaisha. Tilt damper. 4,944,705, Cl. 440-61.000.

Kashio, Tadashi, to Citizen Watch Co., Ltd. Electromagnetic actuator. 4,945,331, Cl. 335-274.000.

Kashiwazaki, Masamichi: *See*—
Motai, Toshiki; and Kashiwazaki, Masamichi, 4,944,252, Cl. 122-470.000.

Kashiyama, Masamori, to Hitachi, Ltd. Write control circuit for a high-speed memory device. 4,945,516, Cl. 365-189.050.

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Katagiri, Yoshihiro: *See*—
Iino, Takashi; and Katagiri, Yoshihiro, 4,944,201, Cl. 74-868.000.

Katayama, Hideaki; Hasegawa, Akira; and Sakaguchi, Katsuyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Tire loading mechanism of a tire cooler for a tire vulcanizing machine. 4,944,951, Cl. 425-58.100.

Katayori, Sinji: *See*—
Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Isumura, Toshihiko; and Katayori, Sinji, 4,945,370, Cl. 354-173.110.

Katcher, Jay H.: *See*—
Bassa, Ivette A.; Destephano, Joseph P.; Katcher, Jay H.; and Schara, Robert E., 4,944,955, Cl. 426-579.000.

Kato, Hirohisa: *See*—
Furuta, Shoichiro; Kato, Hirohisa; and Seto, Hirohito, 4,944,962, Cl. 427-164.000.

Kato, Masahiro: *See*—
Nonoyama, Osamu; and Kato, Masahiro, 4,944,983, Cl. 428-81.000.

Kato, Shigeki; and Suzuki, Yoshihumi, to Brother Kogyo Kabushiki Kaisha. Permanent magnet print head assembly with a square magnet. 4,944,615, Cl. 400-124.000.

Kato, Tadao; Yamagiwa, Akira; and Matsuoka, Eiichi, to Kabushiki Kaisha Ishikawa Seisakusho, Ltd. Spindle driving device of covering machine. 4,944,144, Cl. 57-105.000.

Katoh, Takehiro; Nishimura, Shinichi; and Ishimura, Toshihiko, to Minolta Camera Kabushiki Kaisha. Program exposure calculating apparatus. 4,945,380, Cl. 354-443.000.

Katsuragi, Kenjiro, to Topcon Corporation. Noscontact type tonometer. 4,944,303, Cl. 128-648.000.

Katz, Alan J.: *See*—
Penz, Perry A.; Gately, Michael T.; and Katz, Alan J., 4,945,494, Cl. 364-513.000.

Katz, Seymour; and Schirmer, Marna L., to E-Z-EM, Inc. Single-use annular mouthpiece. 4,944,313, Cl. 128-859.000.

Katzman, Allison W.: *See*—
Osher, John D.; Katzman, Allison W.; Laecke, Mark; and Wildman, John R., 4,944,363, Cl. 273-58.00A.

Kaufhold, Manfred, to Huels Aktiengesellschaft. Process for the purification of 1,1-diphenylethane with good fragrance quality. 4,944,848, Cl. 203-35.000.

Kaufman, Arthur; and Werth, John, to Engelhard Corporation. Cooling assembly for fuel cells. 4,945,010, Cl. 429-26.000.

Kaufman, Lance R.: *See*—
Schmerda, Richard F.; Dombeck, John A.; and Kaufman, Lance R., 4,945,445, Cl. 361-101.000.

Kawabata, Munehiro: *See*—
Itoh, Hisatsugu; and Kawabata, Munehiro, 4,945,336, Cl. 340-438.000.

Kawabata, Yasutomo: *See*—
Ohya, Hideshi; Miyatani, Takao; Kawamura, Keiji; and Kawabata, Yasutomo, 4,945,231, Cl. 250-231.140.

Kawabe, Haruhide: *See*—
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.

Kawabe, Haruo, to Takara Co., Ltd. Moving doll toy. 4,944,708, Cl. 446-175.000.

Kawahara, Eiichiro; Ikejiri, Kenichi; Furumoto, Mitsumasa; and Yamamoto, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulically operated continuously variable transmission. 4,944,154, Cl. 60-488.000.

Kawahara, Hiroshi: *See*—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.

Kawai, Masao: *See*—
Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,945,482, Cl. 364-424.100.

Kawai, Sumio: *See*—
Kobayashi, Masaru; and Kawai, Sumio, 4,944,874, Cl. 210-232.000.

Kawakami, Masahiro: *See*—
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,944,799, Cl. 75-501.000.

Kawamoto, Toshiki: *See*—
Kaneuchi, Kunihiro; Kawamoto, Toshiki; and Nakatani, Tomofumi, 4,945,557 Cl. 379-67.000.

Kawamura, Hiromitsu; Kawamura, Takao; Kobara, Katsumi; and Endo, Yoshishige, to Hitachi, Ltd. Image display panel having antistatic film with transparent and electroconductive properties and process for processing same. 4,945,282, Cl. 313-479.000.

Kawamura, Keiji: *See*—
Ohya, Hideshi; Miyatani, Takao; Kawamura, Keiji; and Kawabata, Yasutomo, 4,945,231, Cl. 250-231.140.

Kawamura, Takao: *See*—
Kawamura, Hiromitsu; Kawamura, Takao; Kobara, Katsumi; and Endo, Yoshishige, 4,945,282, Cl. 313-479.000.

Kawamura, Yasukazu, to Mitsubishi Denki Kabushiki Kaisha. Liquid crystal display unit. 4,945,350, Cl. 340-784.000.

Kawamura, Yasuo: *See*—
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.

Kawasaki, Masahiro; and Sato, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having interchangeable lenses. 4,945,376, Cl. 354-400.000.

Kawasaki, Takeshi; Endo, Junji; Isakozawa, Shigeto; Tomita, Masahiro; and Tonomura, Akira, to Hitachi, Ltd. Field emission electron gun system. 4,945,247, Cl. 250-423.00F.

Kawauchi, Koichi: *See*—
Hosotani, Osamu; Kawauchi, Koichi; and takahashi, Naoki, 4,945,535, Cl. 371-11.100.

Kay, William M.; and Elder, Bruce E., to Boyertown Casket Company; and Vandor Corporation. Corrugated fiberboard casket lids. 4,944,076, Cl. 27-14.000.

Kayaba Kogyo Kabushiki Kaisha: *See*—
Kashima, Mitsuhiro; and Hanawa, Nobumichi, 4,944,705, Cl. 440-61.000.

Keevert, John E., Jr.; McDugle, Woodrow G.; and Eachus, Raymond S., to Eastman Kodak Company. Photographic emulsions containing internally modified silver halide grains. 4,945,035, Cl. 430-567.000.

Keip, Frederick J.: *See*—
Behlendorf, Donald J.; Keip, Frederick J.; and Benson, Robert L., 4,944,102, Cl. 37-135.000.

Keiser, Bernhard E., to Reinforced Earth Company, The. Microwave shielding for satellite earth stations. 4,945,362, Cl. 343-841.000.

Keith, Danny M. Prosthetic drive device for rotatable tool. 4,944,765, Cl. 623-65.000.

Keller, Arnold: *See*—
Link, Helmut D.; and Keller, Arnold, 4,944,762, Cl. 623-23.000.

Keller, Jeff; and Linton, Robert, to Edmonds Medical Systems, Inc. Exercise device with underwater treadmill. 4,944,506, Cl. 272-69.000.

Keller, William K. Foldable track ramp. 4,944,546, Cl. 296-61.000.

Kemira, Inc.: *See*—
Lawhorne, Earl R., 4,944,936, Cl. 423-612.000.

Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Low oxygen content fine spherical copper particles and process for producing same by fluid energy milling and high temperature processing. 4,944,797, Cl. 420-469.000.

Kempf, Richard J.; Dessauer, Rolf; and Freilich, Steven C., to Du Pont de Nemours, E. I., and Company. Photosensitive leuco dye containing electrostatic master with printout image. 4,945,020, Cl. 430-49.000.

Kendrick, George B.: *See*—
Morris, Merle E.; Martin, Michael L.; Neff, Louis D.; and Kendrick, George B., 4,945,288, Cl. 313-25.000.

Kenna, Robert V., to Pfizer Hospital Products Group. Prosthetic knee joint with improved patellar component tracking. 4,944,756, Cl. 623-20.000.

Kenna, Robert V., to Pfizer Hospital Products Group, Inc. Method and instrumentation for the replacement of a knee prosthesis. 4,944,760, Cl. 623-20.000.

Kennedy, James V.: *See*—
Occelli, Mario L.; and Kennedy, James V., 4,944,865, Cl. 208-121.000.

Kennedy, Paul G. Shaftless butterfly valve. 4,944,490, Cl. 251-306.000.

Kent, Lionel W. J.: *See*—
Bagshaw, John M.; Kent, Lionel W. J.; Willats, Terence F.; and Payne, Steven J., 4,945,539, Cl. 372-13.000.

Kent, Walter R.; and Guerrant, Terrence L. Multiple pizza container. 4,944,452, Cl. 229-120.210.

Kentrox Industries, Inc.: *See*—
Schroeder, George L.; Couch, Francis O.; and Saenguraiporn, Chamna, 4,945,533, Cl. 370-32.100.

Keptel, Inc.: *See*—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 4,945,559, Cl. 379-399.000.
Collins, Thomas J.; and Quintana, Peter, 4,945,560, Cl. 379-399.000.

Åkerfeldt, Dan, to C. R. Bard, Inc. Tissue sampling device. 4,944,308, Cl. 128-751.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Bechtold, Volker; and Schweickert, Hermann, 4,945,251, Cl. 250-492.100.

Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., to Smith International, Inc. Hard facing for milled tooth rock bits. 4,944,774, Cl. 51-309.000.

Ketkar, Anil B.: *See*—
Chen, Nai Y.; Ketkar, Anil B.; and Partridge, Randall D., 4,944,862, Cl. 208-49.000.

Keyser, Lloyd A.; Nelson, Donald A.; and Thornton, David C., to Andrew Corporation. Dehumidifier for waveguide system. 4,944,776, Cl. 55-16.000.

Khodr, Gabriel S.: *See*—
Kuehl, Thomas J.; Harper, M. J. K.; Khodr, Gabriel S.; and Siler-Khodr, Theresa M., 4,945,055, Cl. 435-226.000.

Khoshnood, Ben: *See*—
Daly, C. David; and Khoshnood, Ben, 4,945,229, Cl. 250-227.110.

Kiely, John S.; Lesheski, Lawrence E.; and Schroeder, Mel C., to Warner-Lambert Company. Preparation of certain 7-substituted quinolones. 4,945,160, Cl. 540-481.000.

Kienzle, Wolfgang: *See*—
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Kikkawa, Masanari: *See*—
Inoue, Yasuo; Kikkawa, Masanari; Kamba, Masaru; and Okuda, Hiroshi, 4,944,178, Cl. 73-19.100.

Kikuchi, Haruhiko: *See*—
Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, 4,944,746, Cl. 606-195.000.
Kikuchi, Masakazu; Yoshimura, Koji; and Nakahama, Kazuo, to Takeda Chemical Industries, Ltd. Production of human lysozyme. 4,945,051, Cl. 435-172.300.
Kikuchi, Yasushi, to Fuji Photo Film Co., Ltd. Information recording medium having magnetizable hub. 4,944,982, Cl. 428-64.000.
Kilstrom, Lars G.: *See*—
Svanberg, Joakim A.; Kilstrom, Lars G.; Tuvin, Lars G.; and Larsson, Anders E. C., 4,944,065, Cl. 15-327.00C.
Kim, Young G.; and Lim, Yun S., to Poongsan Corporation. Copper alloys for electrical and electronic parts and its manufacturing process. 4,944,915, Cl. 420-479.000.
Kimbara, Hidenori: *See*—
Ohya, Kazuyuki; and Kimbara, Hidenori, 4,944,373, Cl. 188-251.00A.
Kimberly-Clark Corporation: *See*—
Mokry, Patti J., 4,944,735, Cl. 604-385.200.
Kimble, Harry J.; Pereira, Silvania F.; and Walls, Daniel F., to University of Texas System, The. Device and method for quantum nondemolition measurements using parametric oscillation. 4,944,592, Cl. 356-364.000.
Kimura, Akiyoshi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,945,385, Cl. 355-202.000.
Kimura, Masato: *See*—
Yamada, Hideaki; Kimura, Masato; Oka, Masataka; and Saito, Kohta, 4,944,427, Cl. 220-406.000.
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Teramoto, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Data processing device for three dimensional surface machining. 4,945,487, Cl. 364-474.020.
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, to Pioneer Electronic Corporation. Electronic unit operable in conjunction with body unit. 4,945,335, Cl. 340-426.000.
Kimura, Yasuo: *See*—
Ono, Yuzo; Yamanaka, Yutaka; and Kimura, Yasuo, 4,945,529, Cl. 369-109.000.
King, Gregory J. Attic insulating system. 4,944,126, Cl. 52-202.000.
Kingman, Donald D.: *See*—
Holt, J. Birch; Kingman, Donald D.; and Bianchini, Gregory M., 4,944,930, Cl. 423-344.000.
Kingsley, I. Steven; and Turback, Victor S., to Cuisine Crafts, Inc. Process and composition for improving the organoleptic properties of seafood. 4,944,957, Cl. 426-643.000.
Kinney Canada Inc.: *See*—
Haust, Wilhelm M. H.; and Gagnon, Charles E., 4,944,455, Cl. 239-59.000.
Kinney, John W.; Rubasch, Anthony P.; and Degenhart, Thomas W., to Furnas Electric Company. Electrical contactor. 4,945,328, Cl. 335-202.000.
Kinugawa Rubber Industrial Co., Ltd.: *See*—
Miyama, Masayoshi; and Komori, Hiroki, 4,945,123, Cl. 524-269.000.
Kioritz Corporation: *See*—
Hironaka, Yoshiaki; and Matsumoto, Isao, 4,944,711, Cl. 464-52.000.
Kirin Beer Kabushiki Kaisha: *See*—
Abe, Ichiro; and Suzuki, Toshio, 4,944,832, Cl. 156-584.000.
Kirk, Norbert. Expanding staple remover. 4,944,491, Cl. 254-28.000.
Kita, Tatsuya: *See*—
Okino, Yoshinori; Noguchi, Naoyuki; Kita, Tatsuya; and Shigemura, Takuro, 4,944,199, Cl. 74-858.000.
Kitajima, Masahiko: *See*—
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, 4,944,988, Cl. 428-195.000.
Kitamura, Yutaka: *See*—
Iwatani, Shiro; and Kitamura, Yutaka, 4,945,277, Cl. 340-455.000.
Kitano, Noritoshi: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kitano, Noritoshi; Nishida, Akira; Frei, Bruno; and O'Sullivan, Anthony, 4,945,105, Cl. 514-450.000.
Kitano, Seiichi; Asada, Masaaki; and Masaki, Michitomo, to Kabushiki Kaisha Daikin Seisakusho. Diaphragm spring device in a clutch. 4,944,380, Cl. 192-89.00B.
Kiuchi, Toyoo: *See*—
Ishida, Ryuji; and Kiuchi, Toyoo, 4,945,507, Cl. 364-737.000.
Klaus, Kurt, to IWC International Watch Co. AG. Watch. 4,945,521, Cl. 368-21.000.
Klimenov, Alexandr M.: *See*—
Gradoboev, Vladimir T.; Melnikov, Leonid I.; Klimenov, Alexandr M.; and Sitnikov, Alexandr E., 4,944,382, Cl. 198-399.000.
Kline, Loren H.: *See*—
House, William J.; Kline, Loren H.; and McAuliffe, Lawrence, Jr., 4,944,276, Cl. 123-520.000.
Klobucar, W. Dirk: *See*—
Kolich, Charles H.; Klobucar, W. Dirk; and Books, Jeffrey T., 4,945,139, Cl. 525-538.000.
Kolich, Charles H.; and Klobucar, W. Dirk, 4,945,140, Cl. 525-538.000.
Knabel, Walter; Mayer, Josef; and Wentker, Stephan, to Autoliv-Kolb, GmbH. & Co. Device for coupling a bracket which is provided with a buckle of a seat belt, to a retaining member, which is fixed in a vehicle. 4,944,531, Cl. 280-806.000.
Knauder, Josef: *See*—
Grabner, Bernd; Dotsch, Lorenz; Knauder, Josef; and Hoffgen, Hans, 4,944,497, Cl. 266-268.000.
Knecht, Adolf; Daab, Ottfried; and Weil, Hans-Hermann, to Boehringer Ingelheim KG. Sediment baffle for valves of pressurized containers. 4,944,433, Cl. 222-402.200.
Knight, Robert J.: *See*—
Shantz, Ronald B.; and Knight, Robert J., 4,944,977, Cl. 428-36.920.
Knoedler, Roy E.: *See*—
Gebhard, Albert W.; Knoedler, Roy E.; Parker, Robert M.; and Au, William G., 4,944,117, Cl. 49-55.000.
Knutson, Robert D.; Boczkiewicz, Bruce; and Wurster, James C., to Super Products Corporation. Operator protection for high pressure hose machines. 4,944,258, Cl. 134-167.00C.
Kobara, Katsumi: *See*—
Kawamura, Hiromitsu; Kawamura, Takao; Kobara, Katsumi; and Endo, Yoshishige, 4,945,282, Cl. 313-479.000.
Kobayashi, Akira: *See*—
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, 4,944,988, Cl. 428-195.000.
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, to Seiko Epson Corporation. Image forming apparatus. 4,945,383, Cl. 355-30.000.
Kobayashi, Atsushi: *See*—
Yamagata, Kiyohiro; Abe, Nobumasa; Toba, Koichi; Kobayashi, Atsushi; and Watanabe, Koji, 4,945,381, Cl. 355-27.000.
Kobayashi, Fujio: *See*—
Watanabe, Takashi; and Kobayashi, Fujio, 4,944,459, Cl. 239-305.000.
Kobayashi, Hiroyuki: *See*—
Shii, Kazuo; Ohashi, Toshiyuki; and Kobayashi, Hiroyuki, 4,945,237, Cl. 250-311.000.
Kobayashi, Kaoru: *See*—
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.
Kobayashi, Masakazu: *See*—
Tanaka, Hatsuyuki; Kobayashi, Masakazu; Wakiya, Kazumasa; and Nakayama, Toshimasa, 4,944,893, Cl. 252-171.000.
Kobayashi, Masaru; and Kawai, Sumio, to Kabushiki Kaisha Okawara Seisakusho. Centrifugal separator. 4,944,874, Cl. 210-232.000.
Kobayashi, Souichi: *See*—
Sakamura, Ken; and Kobayashi, Souichi, 4,945,472, Cl. 364-200.000.
Kobayashi, Yoichi; Kan, Tatsuhiko; and Terashima, Tsuneo, to Kabushiki Kaisha Yakult Honsha. Method for producing processed milk containing galactooligosaccharide. 4,944,952, Cl. 426-42.000.
Koburger, Charles W., III: *See*—
Cronin, John E.; Cronin, Susan F.; Kaanta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., 4,944,682, Cl. 437-192.000.
Koch, Rudolf: *See*—
Stuhmer, Karl-Gerhart; and Koch, Rudolf, 4,944,761, Cl. 623-23.000.
Willert, Hans-Georg; and Koch, Rudolf, 4,944,763, Cl. 623-23.000.
Koch, Thomas L.; and Koren, Uziel, to AT&T Bell Laboratories. Method of making tapered semiconductor waveguides. 4,944,838, Cl. 156-652.000.
Koerber, Richard: *See*—
Trummer, Guenther; Koerber, Richard; and Mehltretter, Ludwig, 4,945,360, Cl. 342-122.000.
Koerner, Ralph J.: *See*—
Henderson, Martin C.; Koerner, Ralph J.; and Jordan, William D., Jr., 4,945,356, Cl. 340-941.000.
Koga, Yoshiro; Kume, Hiroshi; and Nakao, Kenji, to Onkyo Kabushiki Kaisha. Constant-voltage power supply circuit and amplifier circuit and DA converter using the constant-voltage power supply circuit. 4,945,301, Cl. 323-902.000.
Kogelschatz, Ulrich: *See*—
Eliasson, Baldur; and Kogelschatz, Ulrich, 4,945,290, Cl. 315-246.000.
Koh-I-NOOR Radiograph, Inc.: *See*—
Micale, Fortunato J.; and Gwozdz, Garry T., 4,945,121, Cl. 523-339.000.
Kohler, Ludwig, to Eltro GmbH. System for detecting laser radiation. 4,944,588, Cl. 356-152.000.
Kohli, Dalip K., to American Cyanamid Company. Method for making polyimides and products produced thereby. 4,945,170, Cl. 548-522.000.
Kohli, Jeffrey T.; and Shelby, James E., to Alfred University. Process for preparing a borosilicate glass. 4,944,784, Cl. 65-32.300.
Kohse, Richard: *See*—
Widemann, Friedrich; Kahnau, Guenter; Kohse, Richard; and Raethel, Dieter, 4,944,454, Cl. 237-12.30C.
Kohut, Robert J.: *See*—
Ferren, Bran; Harrison, Charles F.; Hope, Clinton B.; and Kohut, Robert J., 4,945,459, Cl. 362-284.000.
Koike, Kenzo: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.

Koishi, Musubu; Tsujimura, Etsuo; Watanabe, Motoyuki; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Optical waveform observing apparatus. 4,945,224, Cl. 250-213.0VT.
Koito Manufacturing Co., Ltd.: *See*—
Kakidaira, Susumu, 4,945,456, Cl. 362-80.100.
Serizawa, Hiroyuki; and Mochizuki, Akio, 4,945,453, Cl. 362-61.000.
Kojima, Hiroaki: *See*—
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Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, 4,945,506, Cl. 364-736.000.
Kolaska, Hans; and Ettmayer, Peter, to Krupp Widia GmbH. Process for producing a sintered hard metal body and sintered hard metal body produced thereby. 4,944,800, Cl. 75-238.000.
Kolich, Charles H.; Klobucar, W. Dirk; and Books, Jeffrey T., to Ethyl Corporation. Process for surface treating phosphonitrilic fluoroelastomers. 4,945,139, Cl. 525-538.000.
Kolich, Charles H.; and Klobucar, W. Dirk, to Ethyl Corporation. Process for preparation of phosphonitrilic fluoroelastomers. 4,945,140, Cl. 525-538.000.
Kolodzie, Rainer: *See*—
Goerlich, Dieter; Kolodzie, Rainer; and Reiter, Rainer, 4,944,153, Cl. 60-303.000.
Komata, Hiroyuki: *See*—
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, 4,945,335, Cl. 340-426.000.
Komatsu, Fumito: *See*—
Oguchi, Yuzo; Komatsu, Fumito; and Iizawa, Motohiro, 4,945,437, Cl. 360-106.000.
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Miyama, Masayoshi; and Komori, Hiroki, 4,945,123, Cl. 524-269.000.
Kompositprodukter S.K.-F.M.: *See*—
Lindgren, Mats E. G.; and Sjoovist, Ingvar S., 4,944,361, Cl. 181-129.000.
Komurasaki, Satosi, to Mitsubishi Denki Kabushiki Kaisha. Vibration detector. 4,944,179, Cl. 73-35.000.
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Tanji, Masaki; and Nishijima, Toyoki, 4,945,034, Cl. 430-546.000.
Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, 4,944,504, Cl. 271-171.000.
Konig, Nils: *See*—
Heinrichs, Hartmut; Brumsack, Hans-Jurgen; Loftfield, Norman; and Konig, Nils, 4,944,923, Cl. 422-102.000.
Koninklijke Emballage Industrie Van Leer B. V.: *See*—
Ten Bruggencate, Cornelis A.; Montijn, Andreas N.; and Van Keimpema, Gerrit J., 4,944,399, Cl. 206-509.000.
Konishi, Masao; and Tsuchida, Shigeki, to Kabushiki Kaisha Itoki Kosakusho. Carrier apparatus for taking information-storage regular articles in and out. 4,945,430, Cl. 360-92.000.
Konishi Yasuhiro: *See*—
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Yamasaki, Hiroyuki; Konishi Yasuhiro; and Ikeda, Yuto, 4,945,517, Cl. 365-189.010.
Kono, Hiromi: *See*—
Tanouc, Akifumi; Kono, Hiromi; and Satoh, Yuji, 4,944,194, Cl. 74-335.000.
Kooragang Coal Management Pty. Ltd.: *See*—
Jones, Laurence W., 4,944,474, Cl. 246-122.00R.
Kopin Corporation: *See*—
Allen, Lisa P.; Vu, Duy-Phach; Batty, Michael W.; Morrision, Richard H., Jr.; and Zavracky, Paul M., 4,944,835, Cl. 156-620.700.
Kopp, Richard; Oertel, Gunter; Weigand, Eckehard; and Wiedermann, Rolf. Process for the production of polyurethane foams using sterically hindered aromatic diamines. 4,945,120, Cl. 521-163.000.
Koppitz, Richard W.: *See*—
Abstetar, Michael J.; and Koppitz, Richard W., 4,944,612, Cl. 296-39.200.
Kordel, Gerhard: *See*—
Fiedler, Kurt; Kratz, Bernhard; Kordel, Gerhard; and Scheiderer, Gerrit, 4,944,224, Cl. 102-202.200.
Korea Measures Co., Ltd.: *See*—
Kang, Dongmin, 4,944,097, Cl. 33-760.000.
Koren, Uziel: *See*—
Koch, Thomas L.; and Koren, Uziel, 4,944,838, Cl. 156-652.000.
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Munro, Frederick G.; Beavers, Kelly J.; Korngiebel, Ronald W.; Lucchesi, Raymond L.; and Moy, Michael E., 4,945,429, Cl. 360-92.000.
Kortenbrede, Ludger, to Aug. Winkhaus GmbH & Co. KG. Cable lock. 4,944,168, Cl. 70-49.000.
Kortgen, Bernd; Morgen, Helmut; Heinrichs, Heinz-Josef; Fuhrmann, Castor; and Freitag, Herbert, to Stabilus GmbH. Gas spring. 4,944,498, Cl. 267-64.110.
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Matsunami, Hiroshi; Maehara, Kunio; and Kosemura, Susumu, 4,944,859, Cl. 204-244.000.
Koshigoe, Shinpei: *See*—
Shimoma, Taketoshi; Koshigoe, Shinpei; and Hasegawa, Takahiro, 4,945,284, Cl. 313-414.000.
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Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 4,945,383, Cl. 355-30.000.
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Kurita, Yoshio; Takami, Katsuhiro; Tanaka, Kenji; and Kosumi, Yuji, 4,945,398, Cl. 357-74.000.
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Kotyk, Jeffrey M., to McNeil (Ohio) Corporation. Frangible male coupling component. 4,944,534, Cl. 285-4.000.
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Kovacs, Kerry; and Burkholder, Amy, to Mead Corporation, The. Method for improving color balance in imaging systems employing photosensitive microcapsules. 4,945,024, Cl. 430-138.000.
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Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,945,235, Cl. 250-306.000.
Kozima, Ken: *See*—
Yoshida, Tetsushi; and Kozima, Ken, 4,944,577, Cl. 350-346.000.
Kraft General Foods, Inc.: *See*—
Bassa, Ivette A.; Destephano, Joseph P.; Katcher, Jay H.; and Schara, Robert E., 4,944,955, Cl. 426-579.000.
Krajewski, John J.: *See*—
Murphy, Edward J.; Ansel, Robert E.; and Krajewski, John J., 4,945,032, Cl. 430-394.000.
Kramer, Robert A. Method of and system for identification and verification of broadcasting television and radio program segments. 4,945,412, Cl. 358-142.000.
Krasuski, Marek; and Prugnolle, Bernard, to Societe Anonyme dite: Alcatel Satman. Device for opening envelope bodies, and for filling them. 4,944,137, Cl. 53-569.000.
Kratz, Bernhard: *See*—
Fiedler, Kurt; Kratz, Bernhard; Kordel, Gerhard; and Scheiderer, Gerrit, 4,944,224, Cl. 102-202.200.
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Krause, Horst-Juergen; Leinen, Hans-Theo; and Lehmann, Rudolf, to Henkel Kommanditgesellschaft auf Aktien. Antimicrobially active nitriles and the production thereof. 4,945,177, Cl. 558-405.000.
Krause, Ruediger; and Foshag, Reinhard, to Siemens Aktiengesellschaft. Test circuit arrangement for computer-controlled communications switching systems. 4,945,554, Cl. 379-10.000.
Krause, William E.; and Sanford, Norman R., to Allied-Signal Inc. ATCRBS/SIF/TCAS reply decoder. 4,945,550, Cl. 375-94.000.
Krauss-Maffei A.G.: *See*—
Soechtig, Wolfgang, 4,944,599, Cl. 366-132.000.
Krauss, Walter: *See*—
Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, 4,945,137, Cl. 525-375.000.
Kreucher, Raymond N., Jr.: *See*—
Medley, Edward H.; Kreucher, Raymond N., Jr.; Stedman, Dennis F.; and Downs, Thomas R., 4,944,553, Cl. 296-188.000.
Krupp Widia GmbH: *See*—
Kolaska, Hans; and Ettmayer, Peter, 4,944,800, Cl. 75-238.000.
Kryazhevskikh, Nikolai F.: *See*—
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., 4,944,353, Cl. 172-23.000.
Kubo, Kiyoshi; Okamura, Noboru; and Morikura, Susumu, to Matsushita Electric Industrial Co., Ltd. Color television format using pulse frequency and pulse width modulation. 4,945,403, Cl. 358-13.000.
Kubo, Seitoku: *See*—
Takahashi, Tokuyuki; Ito, Hiroshi; and Kubo, Seitoku, 4,944,719, Cl. 475-281.000.
Kubota, Takaharu: *See*—
Suzuki, Hideaki; Hosoda, Kenji; Kubota, Takaharu; and Fukumoto, Yuji, 4,945,039, Cl. 435-7.000.
Kudo, Ichiro: *See*—
Ono, Mamoru; Kudo, Ichiro; and Okazaki, Toshio, 4,944,475, Cl. 248-71.000.
Kudo, Masaki: *See*—
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.
Kuehl, Thomas J.; Harper, M. J. K.; Khodr, Gabriel S.; and Siler-Khodr, Theresa M., to Board of Regents, University of Texas System. Human chorionic gonadotropin releasing factor. 4,945,055, Cl. 435-226.000.
Kugler, Edwin L., to Exxon Research and Engineering Company. Process using cracking calalyst containing strontium carbonate. 4,944,864, Cl. 208-120.000.
Kuhnemund, Bernd: *See*—
Gmur, Bruno; and Kuhnemund, Bernd, 4,944,428, Cl. 222-55.000.
Kuka Schweissanlagen & Roboter GmbH: *See*—
Zimmer, Ernst, 4,944,445, Cl. 228-102.000.
Kulik, Herbert S.: *See*—
LeKuch, Herbert W.; Kulik, Herbert S.; and Lucia, Nicholas J., Jr., 4,944,403, Cl. 206-594.000.
Kulishev, Boris V.; Petlakh, Yakov M.; and Elizarov, Boris V. Apparatus for boning hams of poultry carcasses. 4,944,067, Cl. 17-11.000.
Kulman, Jaromir. Hearing aid. 4,945,569, Cl. 381-68.600.

Kumanoya, Masaki: *See*—
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Yamasaki, Hiroyuki; Konishi Yasuhiro; and Ikeda, Yuto, 4,945,517, Cl. 365-189.010.

Kumar, Shiv R.: *See*—
Kumar, Sudhir; Kumar, Shiv R.; and Becker, Dean A., 4,944,539, Cl. 291-2.000.

Kumar, Sudhir; Kumar, Shiv R.; and Becker, Dean A., to Tranergy Corporation; and General Motors Corporation. Differential creepage control system for optimizing adhesion of locomotives. 4,944,539, Cl. 291-2.000.

Kumata, Masataka: *See*—
Nishino, Hideo; Hattori, Tatsuya; Kushida, Tsuneharu; and Kumata, Masataka, 4,945,153, Cl. 528-337.000.

Kume, Hiroshi: *See*—
Koga, Yoshiro; Kume, Hiroshi; and Nakao, Kenji, 4,945,301, Cl. 323-902.000.

Kunert, Heinz, to Saint-Gobain Recherche. Window glass for motor vehicles and a method for the manufacture thereof. 4,944,984, Cl. 428-83.000.

Kunii, Nobuaki: *See*—
Matsumoto, Yukio; and Kunii, Nobuaki, 4,945,149, Cl. 528-61.000.

Kunze, Karl-Heinz: *See*—
Gotzen, L.; Kunze, Karl-Heinz; and Techow, Claudius, 4,944,743, Cl. 606-61.000.

Kunze, Norbert, to U.S. Philips Corporation. Magnetic tape cassette device to limit movement of the cassette. 4,945,431, Cl. 360-96.500.

Kuo, Wen-Tar: *See*—
Ito, Roy A.; and Kuo, Wen-Tar, 4,945,201, Cl. 219-110.000.

Kuper, Jerry W.; Barrett, Joseph J.; Langert, William E.; Baker, Martin C.; and Stephenson, Andrew N., to Allied-Signal Inc. Fiber optic laser beam delivery system. 4,944,567, Cl. 350-96.180.

Kurakake, Mitsuo; Otsuka, Shoichi; and Muraoka, Yutaka, to Fanuc Ltd. Apparatus for convolution picture processing using delay and intermediate storage. 4,945,496, Cl. 364-518.000.

Kurauchi, Yasuhiro; Akazawa, Michihiro; Harada, Tsuneo; Oyama, Kiyotaka; and Tokuda, Akira, to Tosoh Corporation. Method for purifying a dipeptide ester. 4,944,852, Cl. 204-131.000.

Kurita, Koji: *See*—
Ishikawa, Kenichi; Kurita, Koji; Fukawa, Satoru; and Maeda, Kenji, 4,944,822, Cl. 156-212.000.

Kurita, Yoshio; Takami, Katsuhiro; Tanaka, Kenji; and Kosumi, Yuji, to Rohm Co., Ltd. Overcurrent preventive diode. 4,945,398, Cl. 357-74.000.

Kuroda, Shigenori; and Takechi, Moriaki, to Mitsubishi Denki Kabushiki Kaisha. Magnetic field compensating apparatus. 4,945,446, Cl. 361-146.000.

Kusek, Peter A. Guitar with adjustable tremolo. 4,944,208, Cl. 84-313.000.

Kushida, Tsuneharu: *See*—
Nishino, Hideo; Hattori, Tatsuya; Kushida, Tsuneharu; and Kumata, Masataka, 4,945,153, Cl. 528-337.000.

Kuwano, Yoshimasa: *See*—
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Terauchi, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, 4,945,487, Cl. 364-474.020.

Kuwata, Masayoshi, to General Electric Company. Combustor line with air staging for NOx control. 4,944,149, Cl. 60-39.230.

Kuzunuki, Soshiro: *See*—
Ihamoto, Masahiko; Shimada, Satoshi; Ohyama, Shinji; Sato, Manabu; Kuzunuki, Soshiro; and Kano, Mitsunari, 4,945,348, Cl. 340-784.000.

Kwok, Lloyd A. Method of making dental copings. 4,944,901, Cl. 264-19.000.

Kwon, Heemin; and Liang, Jeanine T., to Eastman Kodak Company. Digital image sharpening method using SVD block transform. 4,945,502, Cl. 364-574.000.

Kyodo Printing Co., Ltd.: *See*—
Fukushima, Yoichi; Fujita, Minoru; Kakinuma, Yuji; and Haga, Toshio, 4,945,215, Cl. 235-457.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Oki, Mitsuyoshi; and Ishijima, Shunichi, 4,945,059, Cl. 435-254.000.

Kyowa Machinery Co., Ltd.: *See*—
Fukushima, Junzo, 4,944,411, Cl. 209-705.000.

La Telemecanique Electrique: *See*—
Gohl, Pierre; Llabres, Raymond; and Malgouires, Pascal, 4,945,451, Cl. 361-386.000.
Mailly, Regis; Thierry, Jean Pierre; and Verdenne, Serge, 4,944,687, Cl. 439-207.000.

Labbe, Jean-Marie; Damhuis, Eduard H. J.; and Cox, Robert E. L., to KabiVitrum AB. Implantable piezoelectric pump system. 4,944,659, Cl. 417-322.000.

Labelle, H. M. Robert; Cant, Norman H.; and Garrow, Cecil M., to Martinray Industries Ltd. Closure lock. 4,944,169, Cl. 70-100.000.

LaBelle, Raymond A.: *See*—
MacDonald Bruce G.; Hulburd, William G.; and LaBelle, Raymond A., 4,944,580, Cl. 350-611.000.

Labthermics Technologies, Inc.: *See*—
Kabachinski, Jeffery L.; and Fetter, Richard W., 4,945,318, Cl. 333-12.000.

Lacker, Anna M.; Margerum, J. David; Ramos, Elena; Smith, Willis H., Jr.; and Lim, Khoon C., to Hughes Aircraft Company. Film with partial pre-alignment of polymer dispersed liquid crystals for electro-optical devices, and method of forming the same. 4,944,576, Cl. 350-334.000.

LaCourse, Joanne S.: *See*—
Boudreau, Robert A.; and LaCourse, Joanne S., 4,944,569, Cl. 350-96.200.

Ladney, Michael: *See*—
Hendry, James W., 4,944,910, Cl. 264-572.000.

Laessig, John D.: *See*—
Biddle, Ernest L., Jr.; Laessig, John D.; and Oehrle, John B., 4,945,490, Cl. 364-506.000.

Laird, James A.: *See*—
Gibbs, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., 4,944,905, Cl. 264-62.000.

Lam, Philip Y. Timepiece glass assembly and a timepiece. 4,945,523, Cl. 368-285.000.

Land, Cecil E. Method of bistable optical information storage using antiferroelectric phase PLZT ceramics. 4,945,514, Cl. 365-117.000.

Landa, Benzion; Ezuz, Shabtai; Shmaiser, Aron; Pinhas, Hanna; and Lior, Ishaiau, to Spectrum Sciences B.V. Image transfer apparatus and method using tension transfer member. 4,945,387, Cl. 355-271.000.

Landi, Vincent R., to Rogers Corporation. Method of making a curved plastic body with circuit pattern. 4,944,087, Cl. 29-848.000.

Landry, Doyle L. Self locking trailer hitch. 4,944,525, Cl. 280-479.300.

Lang, Gary D.; and Sink, Brian E., to Liquid Carbonic Corporation. Helical conveyor food freezer. 4,944,162, Cl. 62-380.000.

Lang, Gerard: *See*—
Maignan, Jean; Restle, Serge; and Lang, Gerard, 4,945,093, Cl. 514-235.800.

Lang, Hans-Walter; and Straka, Alfred, to Kaltenbach & Voight GmbH & Co. Artificial denture-skull for dental purposes. 4,944,680, Cl. 434-264.000.

Lang, Thomas G. Semi-submerged ship. 4,944,238, Cl. 114-61.000.

Langen, Gunter; and Jung, Harald, to Karl Otto Braun KG. Method of manufacturing a cohesive bandage. 4,944,958, Cl. 427-2.000.

Langen, Hans; Fartmann, Norbert; and Coesen, Herbert, to Jean Walterscheid GmbH. Three-point coupling device. 4,944,354, Cl. 172-47.000.

Langer, Erwin E.: *See*—
Oleson, John C.; Teske, Steven K.; Iturzaeta, Richard F.; and Langer, Erwin E., 4,944,647, Cl. 414-412.000.

Langert, William E.: *See*—
Kuper, Jerry W.; Barrett, Joseph J.; Langert, William E.; Baker, Martin C.; and Stephenson, Andrew N., 4,944,567, Cl. 350-96.180.

Langner, Bernd; and Wilde, Rene-Holger, to Norddeutsche Affinerie Aktiengesellschaft. Process for producing copper hydroxide. 4,944,935, Cl. 423-604.000.

Lanier, Carroll W.; and Lee, Raymond, to Ethyl Corporation. Polyimide compositions and processes. 4,944,902, Cl. 264-25.000.

Larkin, Mark. Club removal indicator. 4,944,396, Cl. 206-315.600.

Larrieu, David. Construction prop base. 4,944,123, Cl. 52-127.200.

Larsson, Anders E. C.: *See*—
Svanberg, Joakim A.; Kilstrom, Lars G.; Tuvin, Lars G.; and Larsson, Anders E. C., 4,944,065, Cl. 15-327.00C.

Laser Alignment, Inc.: *See*—
Nielsen, Edward G.; and Steenwyk, Timothy E., 4,945,221, Cl. 250-203.100.

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Jansen, Gerardus L. M.; Grassens, Leonardus J.; and Hollen, Zdenek T., 4,945,526, Cl. 369-44.110.

Lauener Engineering AG: *See*—
Lauener, Wilhelm F., 4,944,342, Cl. 164-485.000.

Lauener, Wilhelm F., to Lauener Engineering AG. Process and device for cooling rollers. 4,944,342, Cl. 164-485.000.

Laurent, Henry: *See*—
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, 4,945,064, Cl. 436-503.000.

Laurent, Pierre A.: *See*—
Auger, Gerard; Laurent, Pierre A.; and Mocchi, Patrick, 4,945,312, Cl. 329-345.000.

Lautner, Max; Hoffman, Fred; and Melnikov, Edward, to Uppco Incorporated. Means for assembling electric motors with reduced endplay. 4,944,085, Cl. 29-732.000.

Law, Edward K. H.: *See*—
Driscoll, John L.; Law, Edward K. H.; Masson, Gerald M.; Coraluppi, Giorgio L.; and Kancel, Michael A., 4,945,534, Cl. 370-62.000.

Lawhorne, Earl R., to Kemira, Inc. Titanium dioxide with high purity and uniform particle size and method therefore. 4,944,936, Cl. 423-612.000.

Lawless, Michael: *See*—
Pastrone, John; Fellingham, George H.; and Lawless, Michael, 4,944,191, Cl. 73-599.000.

Lawrence, Paul B.: *See*—
Fagerburg, David R.; Rule, Mark; Watkins, Joseph J.; and Lawrence, Paul B., 4,945,155, Cl. 528-480.000.

Lawson, John A., to Eotron Corporation. Multiple pentaprism scanning device and method. 4,945,287, Cl. 250-236.000.

Le Carbone Lorraine: *See*—
Bauer, Jean-Michel; Maire, Jacques; and Verna, Maurice, 4,944,996, Cl. 428-307.700.

Leach & Garner: *See*—
Alexander, Guy B.; and Nadkarni, Ravindra M., 4,944,985, Cl. 428-570.000.

Leanna, Glen B.: *See*—
Wittkopf, Eugene W.; and Leanna, Glen B., 4,945,293, Cl. 318-7.000.

Leathers, Amy Z.; and Greer, S. Thomas, to PPG Industries, Inc. Fungicidal and algicidal detergent compositions. 4,944,892, Cl. 252-92.000.

Lee, Anthony L.: *See*—
Erekson, Erek J.; Lee, Anthony L.; Barone, S. Peter; and Solomon, Irvine J., 4,945,078, Cl. 502-202.000.

Lee Company: *See*—
Holtermann, Ludwig K., 4,944,487, Cl. 251-129.170.

Lee, Dolk: *See*—
Wallace, Karen L.; and Lee, Dolk, 4,945,134, Cl. 525-301.000.

Lee, Fu Ming, to Phillips Petroleum Company. Extractive distillation of cycloalkane/alkane feed employing solvent mixture. 4,944,849, Cl. 203-55.000.

Lee, George W.: *See*—
Gibbs, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., 4,944,905, Cl. 264-62.000.

Lee, Gim F., Jr.: *See*—
Abolins, Visvaldis; Betts, Joseph E.; Holub, Fred F.; and Lee, Gim F., Jr., 4,945,018, Cl. 524-141.000.

Lee, James. Disposable seasoning or condiment dispenser. 4,944,435, Cl. 222-565.000.

Lee, Kun-Ming; and Hwang, Ching-Dong, to Acer Incorporated. Interface control circuit with active circuit charge or discharge. 4,945,264, Cl. 307-475.000.

Lee, Raymond: *See*—
Lanier, Carroll W.; and Lee, Raymond, 4,944,902, Cl. 264-25.000.

Leebeek, Antonius C. G.; and Johnston, James P., to Procter & Gamble Company, The. Device for the washing of fabric by machine. 4,944,165, Cl. 68-17.00R.

Leebeek, Antonius C. G.: *See*—
Van Onstein, Elco T. J. M.; and Leebeek, Antonius C. G., 4,944,400, Cl. 206-509.000.

Leffingwell, Burton C.: *See*—
Velke, David C., Sr.; Marsden, George P.; and Leffingwell, Burton C., 4,944,699, Cl. 439-784.000.

Legoux, Richard; Leplatois, Pascal; Joseph, Evelyne L.; Niaudet, Brigitte; and Roskam, Willem, to Societe Anonyme: Sanofi. Microbiological process for the preparation of a protein by culturing a mutant bacterial strain. 4,945,047, Cl. 435-69.400.

Lehmann, Rudolf: *See*—
Krause, Horst-Juergen; Leinen, Hans-Theo; and Lehmann, Rudolf, 4,945,177, Cl. 558-405.000.

Lehmkuhl, Robert A. Torque thrust and surface sensing device. 4,944,643, Cl. 409-80.000.

Leibowitz, Joseph D., to TRW, Inc. Electrical junction box and method for its manufacture. 4,944,684, Cl. 439-76.000.

Leigh-Jones, Peter: *See*—
Gamgee, Christopher J.; Leigh-Jones, Peter; and Jungo, Charles, 4,945,225, Cl. 250-214.00B.

Leinen, Hans-Theo: *See*—
Krause, Horst-Juergen; Leinen, Hans-Theo; and Lehmann, Rudolf, 4,945,177, Cl. 558-405.000.

Leinhaas, Werner, to E. Bruderer Maschinenfabrik AG. Articulated lever cutting and forming press. 4,944,221, Cl. 100-286.000.

Leising, Maurice B.: *See*—
Benford, Howard L.; Leising, Maurice B.; and Holbrook, Gerald L., 4,944,200, Cl. 74-867.000.

Leist, Alan R., to Pipp Mobile Systems, Inc. Mobile storage system with driving assemblies. 4,944,231, Cl. 104-287.000.

LeKuch, Herbert W.; Kulik, Herbert S.; and Lucia, Nicholas J., Jr., to Vibration Mountings & Controls, Inc. Shock mount container. 4,944,403, Cl. 206-594.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Benitz, William E.; and Bernfield, Merton, 4,945,086, Cl. 514-56.000.

Lemm, Wilfried G.: *See*—
Barbucci, Rolando; Ferruti, Paolo; Grossi, Adalberto; and Lemm, Wilfried G., 4,944,767, Cl. 623-66.000.

Lemmerman, Marvin C.: *See*—
Petersen, Robert J.; and Lemmerman, Marvin C., 4,944,416, Cl. 211-87.000.

Lenz, Michael: *See*—
Schwertlein, Frank-Lothar; and Lenz, Michael, 4,945,444, Cl. 361-101.000.

Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab): *See*—
Grue-Sorensen, Gunnar; and Nielsen, Christian K., 4,945,098, Cl. 514-365.000.

Leonard, Robert. Adjustable shower head and clock apparatus. 4,944,049, Cl. 4-597.000.

Leonardo, Ignazio E., to A K Stamping Co., Inc. Grounding clamp. 4,944,683, Cl. 439-96.000.

Leplatois, Pascal: *See*—
Legoux, Richard; Leplatois, Pascal; Joseph, Evelyne L.; Niaudet, Brigitte; and Roskam, Willem, 4,945,047, Cl. 435-69.400.

Lerner, Bernard: *See*—
Lerner, Hershey; and Lerner, Bernard, 4,945,252, Cl. 250-548.000.

Lerner, Hershey; and Lerner, Bernard, to Automated Packaging Systems, Inc. Continuous web registration. 4,945,252, Cl. 250-548.000.

Lesheski, Lawrence E.: *See*—
Kiely, John S.; Lesheski, Lawrence E.; and Schroeder, Mel C., 4,945,160, Cl. 540-481.000.

Leslie, Thomas M.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,944,895, Cl. 252-299.010.

Lessat-Kaupat, Wolfgang: *See*—
Kallies, Guenter; and Lessat-Kaupat, Wolfgang, 4,944,473, Cl. 244-129.500.

Lesslie, David J.: *See*—
DeBiasi, Mark S.; Danek, Robert J.; Sailer, Hanns P.; Goldman, Ira B.; and Lesslie, David J., 4,945,443, Cl. 361-93.000.

Letize, Raymond A.: *See*—
Cordani, John L.; and Letize, Raymond A., 4,944,851, Cl. 204-106.000.

Leu, Wen-Fong. Lamp apparatus for generating sequential flashes. 4,945,279, Cl. 315-201.000.

Leveque, Denis J.; and Czarnecki, Neil A., to Eaton Corporation. Method for forming a molded plastic article. 4,944,908, Cl. 264-232.000.

Lever Brothers Company: *See*—
Inward, Peter W., 4,944,933, Cl. 423-462.000.

Levin, Herman W. Evanescent wave background fluorescence/absorbance detection. 4,945,245, Cl. 250-461.200.

Levine, Aaron J. Spring driving and winding machine. 4,944,465, Cl. 242-54.00R.

Levine, Frank E.: *See*—
Elliott, Linda C.; Horn, Gary R.; Jordan, Lloyd E., II; Levine, Frank E.; Shih, Cheng-Fong; and Myre, William W., Jr., 4,945,474, Cl. 364-200.000.

Lian, Jon C. Carbon dioxide welding gun. 4,945,208, Cl. 219-137.610.

Liang, Jeanine T.: *See*—
Kwon, Heemin; and Liang, Jeanine T., 4,945,502, Cl. 364-574.000.

Liang, Ranty H.: *See*—
Gupta, Amitava; Liang, Ranty H.; and Yavrouian, Andre H., 4,945,001, Cl. 428-412.000.

Lieberman, Jon E.: *See*—
Davis, Donald E.; Ho, Cecil T.; Lieberman, Jon E.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,945,246, Cl. 250-492.200.

Lieberman, Lev A. Zero-current switching DC to DC full-wave mode converter. 4,945,462, Cl. 363-17.000.

Lilly, Norman R.; Marin, M. James; and Field, Michael E., to Pitney Bowes Inc. Label printing system for a computer output line printer. 4,944,827, Cl. 156-384.000.

Lim, Hong S., to Hughes Aircraft Company. Capillary mixing of immiscible liquids in a battery cell. 4,945,013, Cl. 429-104.000.

Lim, Khoon C.: *See*—
Lacker, Anna M.; Margerum, J. David; Ramos, Elena; Smith, Willis H., Jr.; and Lim, Khoon C., 4,944,576, Cl. 350-334.000.

Lim, Yun S.: *See*—
Kim, Young G.; and Lim, Yun S., 4,944,915, Cl. 420-479.000.

Lin Pac Mouldings Limited: *See*—
Mead, Peter L., 4,944,404, Cl. 206-600.000.

Linden, Gerbert: *See*—
Schroder, Ludwig; Stransky, Werner; Mengel, Rudolf; Raddatz, Erich; Lust, Sigmund; Linden, Gerbert; and Schneider, Gerhart, 4,944,791, Cl. 71-92.000.

Lindert, Andreas; and Wolpert, Stephen M., to Henkel Corporation. Tannin mannich adducts for improving corrosion resistance of metals. 4,944,812, Cl. 148-251.000.

Lindgren, Mats E. G.; and Sjoovist, Ingvar S., to Kompositprodukter S.K.-F.M. Acoustic ear muff. 4,944,361, Cl. 181-129.000.

Lindner, Christian: *See*—
Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Merten, Josef, 4,945,124, Cl. 525-63.000.

Lindsey, Kevin; and Smith, Stuart T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the. Precision motion slideways. 4,944,606, Cl. 384-42.000.

Lindsley, Brett L.: *See*—
Gerson, Ira A.; and Lindsley, Brett L., 4,945,570, Cl. 381-110.000.

Lindstrom, Terry D.; and Whitaker, Gary W., to Eli Lilly and Company. Dirithromycin metabolite. 4,945,080, Cl. 514-29.000.

Linga, Hogne; and Eliassen, Carlo, to Norsk Hydro A.S. Method for renovating ring chamber furnaces. 4,944,672, Cl. 432-3.000.

Link, Helmut D.; and Keller, Arnold, to interplanta Arzt-und Krankenhausbedarf GmbH. Joint endoprosthesis. 4,944,762, Cl. 623-23.000.

Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., to Vent-Plant Corporation. Method of manufacturing synthetic bone coated surgical implants. 4,944,754, Cl. 623-16.000.

Linton, Robert: *See*—
Keller, Jeff; and Linton, Robert, 4,944,506, Cl. 272-69.000.

Lior, Ishaiau: *See*—
Landa, Benzion; Ezuz, Shabtai; Shmaiser, Aron; Pinhas, Hanna; and Lior, Ishaiau, 4,945,387, Cl. 355-271.000.

Liposome Technology, Inc.: *See*—
Uster, Paul S.; Fielding, Robert M.; and Martin, Francis J., 4,944,948, Cl. 424-450.000.

Liquid Carbonic Corporation: *See*—
Lang, Gary D.; and Sink, Brian E., 4,944,162, Cl. 62-380.000.

Lisnet, Charles J.: *See*—
Hasl, Siegfried C.; and Lisnet, Charles J., 4,944,665, Cl. 425-116.000.

Lithium Corporatoin of America: *See*—
Mehta, Vijay C.; Rathman, Terry L.; Sanchez, Ramiro; and Morrison, Robert C., 4,944,894, Cl. 252-182.120.

Litman, David; Zuk, Robert; and Rowley, Gerald, to Syntex (U.S.A.) Inc. Chromatographic strip having non-compressed edges. 4,945,205, Cl. 219-121.720.

Litton Systems, Inc.: *See*—
Belt, Roger F.; and Uhrin, Robert, 4,944,833, Cl. 156-617.100.

Lin, Leland L.; and Cyr, Patricia A., to Mobil Oil Corporation. Oriented white opaque multilayer heat sealable film and method of forming same. 4,944,990, Cl. 428-353.000.

Liu, Yaguang. Pharmaceutical composition for inhibiting viruses and increasing immune function (PII). 4,944,946, Cl. 424-195.100.

Liu, Yaguang. Process for preparing ferulic acid. 4,945,115, Cl. 514-731.000.

Llabres, Raymond: *See*—
Gobl, Pierre; Llabres, Raymond; and Malgouires, Pascal, 4,945,451, Cl. 361-386.000.

Lockridge, James E.; and Fritz, James S., to Iowa State University Research Foundation, Inc. Decontamination of water using nitrate selective ion exchange resin. 4,944,878, Cl. 210-683.000.

Loftfield, Norman: *See*—
Heinrichs, Hartmut; Brumsack, Hans-Jurgen; Loftfield, Norman; and Konig, Nils, 4,944,923, Cl. 422-102.000.

Lohn, Gerd, to Kaltenbach & Voigt GmbH & Co. Dental spray handpiece. 4,944,675, Cl. 433-32.000.

L'Oreal: *See*—
Maignan, Jean; Restle, Serge; and Lang, Gerard, 4,945,093, Cl. 514-235.800.

Lorenz, Gisela: *See*—
Zipplies, Matthias; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, 4,945,112, Cl. 514-555.000.

Lorenzoni, Loreno: *See*—
Messina, Giuseppe; Calaresu, Paolo; and Lorenzoni, Loreno, 4,945,161, Cl. 544-401.000.

Loser, Karl H.: *See*—
Dybsky, John M.; Erswell, George A., Jr.; Silvestri, John L.; Loser, Karl H.; and McDonald, Craig A., 4,944,818, Cl. 156-71.000.

Lovik, Craig J. Balloon sculpturing methods, apparatus and products. 4,944,709, Cl. 446-221.000.

Lovrien, Glenn A.: *See*—
Carver, Larry L.; Zamzow, Charles E.; Mladenoff, Donald D.; and Lovrien, Glenn A., 4,945,488, Cl. 364-474.240.

Lowther, Frank E., to Atlantic Richfield. Coil and Hall device circuit for sensing magnetic fields. 4,945,306, Cl. 324-220.000.

Lu, Toh-Ming; and Mei, Shao-Ning, to Rensselaer Polytechnic Institute. Deposition of metals on stepped surfaces. 4,944,961, Cl. 427-38.000.

Lucas Industries Public Limited Company: *See*—
Briggs, Stuart J., 4,944,214, Cl. 92-98.00R.

Lucchesi, Raymond L.: *See*—
Munro, Frederick G.; Beavers, Kelly J.; Korngiebel, Ronald W.; Lucchesi, Raymond L.; and Moy, Michael E., 4,945,429, Cl. 360-92.000.

Luce, Stephen E.: *See*—
Cronin, John E.; Cronin, Susan F.; Kaanta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., 4,944,682, Cl. 437-192.000.

Lucia, Nicholas J., Jr.: *See*—
LeKuch, Herbert W.; Kulik, Herbert S.; and Lucia, Nicholas J., Jr., 4,944,403, Cl. 206-594.000.

Luecke, Mark: *See*—
Osher, John D.; Katzman, Allison W.; Luecke, Mark; and Wildman, John R., 4,944,363, Cl. 273-58.00A.

Lui, Yaguang. Pharmaceutical composition for inhibiting viruses and increasing immune function (PII). 4,944,945, Cl. 424-195.100.

Lundergan, Robert G., to AMP Incorporated. Programmable sealed connector. 4,944,688, Cl. 439-275.000.

Lunkenheimer, Winfried; Berg, Dieter; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal N,N'-diacylaminals. 4,945,111, Cl. 514-521.000.

Lunt, James: *See*—
Meunier, Paul J.; Lunt, James; and MacPherson, Edwin J., 4,945,077, Cl. 502-168.000.

Lust, Sigmund: *See*—
Schroder, Ludwig; Stransky, Werner; Mengel, Rudolf; Raddatz, Erich; Lust, Sigmund; Lindes, Gerbert; and Schneider, Gerhart, 4,944,791, Cl. 71-92.000.

Luttrell, Donald A.: *See*—
Orlando, Franklin P.; Butler, Lee D.; Luttrell, Donald A.; and Goulart, Joseph S., 4,944,141, Cl. 56-17.100.

Luxon, Bruce A.; and Murthy, Malalur V., to American Cyanamid. Elongated molding granules and injection-molding process employing them. 4,944,965, Cl. 427-389.700.

Luyten, Jacobus H., to Helma Tegelen B. V. Procedure for machining wooden articles, installation for carrying out a procedure of this type and clamping bench to be used in an installation of this type. 4,944,339, Cl. 144-363.000.

Lyakov, Nedyalko K.; Haralampiev, Georgi A.; Nikolov, Todor G.; Bayukliev, Georgi S.; Petrov, Peter S.; Valchev, Peter V.; Myuftiev, Valcho P.; and Primov, Kalin T., to Nauchno-Installation Sektor-Vchti. Method and installation for obtaining enriched fractions from used storage batteries. 4,944,869, Cl. 209-173.000.

Lydic-Mettler, Joan S.: *See*—
Griesbaum, Theodore J.; Lydic-Mettler, Joan S.; Flores, Pamela A.; Jasek, Anthony B.; and Wrzensinski-Cenran, Mary A., 4,944,556, Cl. 297-437.000.

MacDermid, Incorporated: *See*—
Cordani, John L.; and Letize, Raymond A., 4,944,851, Cl. 204-106.000.

MacDonald Bruce G.; Hulburd, William G.; and LaBelle, Raymond A., to Thermo Electron Technologies Corp. Active segmented mirror including a plurality of piezoelectric drivers. 4,944,580, Cl. 350-611.000.

Machado, Romeu: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

Mack, William J.: *See*—
Cote, William F.; and Mack, William J., 4,945,484, Cl. 364-424.100.

MacPherson, Edwin J.: *See*—
Meunier, Paul J.; Lunt, James; and MacPherson, Edwin J., 4,945,077, Cl. 502-168.000.

MacPherson, Martyn T.: *See*—
Grant, Andrew I.; MacPherson, Martyn T.; and Stevens, David G., 4,945,249, Cl. 250-461.100.

Madden, Patrick C., II; and Foroulis, Z. Andrew, to Exxon Research and Engineering Company. Use of thiosulfate salt for corrosion inhibition in acid gas scrubbing processes. 4,944,917, Cl. 422-13.000.

Madsen, Holger, to ALFA-Laval Agri Scandinavia A/S. Rail transportation system with switches. 4,944,227, Cl. 104-103.000.

Maeda, Hajime; and Tsuneda, Masayuki, to Daifuku Co., Ltd. Conveyor apparatus using automotive cart. 4,944,230, Cl. 104-139.000.

Maeda, Keisuke: *See*—
Hashimoto, Takeshi; and Maeda, Keisuke, 4,945,371, Cl. 354-195.130.

Maeda, Ken-ichi; Saito, Mitsuo; Aikawa, Takeshi; Matoba, Tsukasa; and Okamura, Mitsuyoshi, to Kabushiki Kaisha Toshiba. Register device. 4,945,510, Cl. 364-900.000.

Maeda, Kenji: *See*—
Ishikawa, Kenichi; Kurita, Koji; Fukawa, Satoru; and Maeda, Kenji, 4,944,822, Cl. 156-212.000.

Maeda, Koichi; Takigawa, Akio; Tago, Yasuyoshi; and Yoshida, Motoaki, to Nippon Sheet Glass Co., Ltd. Plastic multifocal point spherical lens. 4,944,584, Cl. 351-172.000.

Maehara, Kunio: *See*—
Matsunami, Hiroshi; Maehara, Kunio; and Kosemura, Susumu, 4,944,859, Cl. 204-244.000.

Maekawa, Masao: *See*—
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, 4,944,988, Cl. 428-195.000.

Maekawa, Yoshikazu: *See*—
Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, 4,944,504, Cl. 271-171.000.

Maerte, Leo: *See*—
Graf, Lothar; Maerte, Leo; and Skorka, Thomas, 4,944,430, Cl. 222-259.000.

Mag-Tek Inc.: *See*—
Suzuki, Kenji; and Sheldon, Dunstan P., 4,944,619, Cl. 400-224.200.

Magner, Joseph L.: *See*—
Schroeder, Roger A.; Broyden, Robert H.; Dearstyne, Robert C.; Magner, Joseph L.; Gephart, Randall J.; Dayton, David W.; and Newman, Raymond A., 4,944,056, Cl. 5-81.00R.

Mahler, Thomas G.: *See*—
Aurness, Harold O.; and Mahler, Thomas G., 4,944,422, Cl. 220-20.000.

Mahon, Joseph J.; and Aigner, Robert K., to Eaton Corporation. Providing a programmer/timer with dual rate drive. 4,945,196, Cl. 200-38.00C.

Maignan, Jean; Restle, Serge; and Lang, Gerard, to L'Oreal. Novel derivatives of ureylene, 2,4-triaminopyrimidine-3- oxide, their preparation and use in cosmetic and pharmaceutical compositions. 4,945,093, Cl. 514-235.800.

Mailly, Regis; Thierry, Jean Pierre; and Verdenne, Serge, to La Telemecanique Electrique. Deformable electrical connection system. 4,944,687, Cl. 439-207.000.

Maire, Jacques: *See*—
Bauer, Jean-Michel; Maire, Jacques; and Verna, Maurice, 4,944,996, Cl. 428-307.700.

Makabe, Hideki; and Iwahashi, Kenji, to Shimadzu Corporation. Soft X-ray lithographic system. 4,945,551, Cl. 378-34.000.

Makabe, Takahito; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, to Nissan Chemical Industries, Ltd. 3(2H)-pyridazinone compounds derivatives and compositions for controlling and/or preventing insect pests intermediates for such compounds, and a process for their manufacture. 4,945,091, Cl. 514-252.000.

Makarewicz, Stanley R.: *See*—
Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.

Malachowsky, Chris; and Priem, Curtis, to Sun Microsystems, Inc. Method and apparatus for translating rectilinear information into scan line information for display by a computer system. 4,945,497, Cl. 364-518.000.

Malcolm-Brown, Tessa: *See*—
Milner, Bruce A.; Malcolm-Brown, Tessa; and Southern, Eric, 4,945,015, Cl. 523-179.000.

Malgouires, Pascal: *See*—
Gohl, Pierre; Llabres, Raymond; and Malgouires, Pascal, 4,945,451, Cl. 361-386.000.

Malik, Roger J.: *See*—
Beltram, Fabio; Capasso, Federico; Malik, Roger J.; and Shah, Nitin J., 4,945,393, Cl. 357-23.500.

Mall, Michael G.: *See*—
Clark, Carl E.; Ganek, Alan G.; Mall, Michael G.; and Page, David R., 4,945,480, Cl. 364-200.000.

Mallory, Chester L.; Wasserman, Phillip D.; Pham, Hung V.; and Broome, Barry G., to Prometrix Corporation. Autofocusing system for microscope having contrast detection means. 4,945,220, Cl. 250-201.300.

Mallory, Thomas H.; McTighe, Timothy; and Noiles, Douglas G., to Joint Medical Products Corporation. Porous-coated artificial joints. 4,944,759, Cl. 623-22.000.

Mally, Timothy G.: *See*—
Cornish, Darrell G.; Mally, Timothy G.; Thiemann, Daniel A.; and Thompson, Bjorn J., 4,944,603, Cl. 383-5.000.

Mallya, Prakash; Ozari, Yehuda; and Smith, Colin C., to Avery International Corporation. Suspension polymerization in an organic medium. 4,944,888, Cl. 210-787.000.

Malnati, Robert J.: *See*—
Rusterholz, John T.; Homan, Charles J.; Brown, Lowell E.; Bennett, Donald B.; Malnati, Robert J.; and Hamstra, James R., 4,945,479, Cl. 364-200.000.

Malone, Peter J.; Thompson, Michael B.; Torrence, Robert J.; and Gaudette, Marvin F., to Eaton Corporation. Thermostatic expansion valve with electronic controller. 4,944,160, Cl. 62-180.000.

Maloney, James V., Jr.: *See*—
Buckberg, Gerald D.; Maloney, James V., Jr.; Jones, Kenneth A.; and West, Weldon D., 4,944,729, Cl. 604-164.000.

MAN Gutehoffnungshutte GmbH: *See*—
Blotenberg, Wilfried, 4,944,652, Cl. 415-27.000.

Mann, Arnold, to VDO Adolf Schindling AG. Electropneumatic displacement device for a throttle valve of an internal combustion engine. 4,944,267, Cl. 123-339.000.

Mann, Robert N., to Mig Vac Inc. Welding gun swivel. 4,945,209, Cl. 219-137.310.

Mansoor, Dhafer Y.; and Pohto, Arnold O., to Ford Motor Company. Sliding radiator grill. 4,944,540, Cl. 293-115.000.

Manville Corporation: *See*—
Buford, John C.; and Porter, Leslie H., 4,944,405, Cl. 206-614.000.

Manz, Bernhard: *See*—
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, 4,945,064, Cl. 436-503.000.

Manzer, Leo E.; Rao, V. N. Mallikarjuna; Rockwell, Richard T.; Sisk, Michael A.; Warwas, Edwin J.; and Winteringham, Roy, to Du Pont de Nemours, E. I., and Company. Process for the separation of HF via Azeotropic distillation. 4,944,846, Cl. 203-1.000.

Maples, Paul D. Spacerless feed channel membrane filter element. 4,944,877, Cl. 210-321.740.

Marach, David R., to Cooper Industries, Inc. Holder for a removable circuit element. 4,944,691, Cl. 439-516.000.

Marcinko, Joseph J., to Beloit Corporation. Polyurethane extended nip press blanket. 4,944,844, Cl. 162-205.000.

Marcus, Harris L.: *See*—
Bourell, David L.; Marcus, Harris L.; Barlow, Joel W.; Beaman, Joseph J.; and Deckard, Carl R., 4,944,817, Cl. 156-62.200.

Margerum, J. David: *See*—
Lacker, Anna M.; Margerum, J. David; Ramos, Elena; Smith, Willis H., Jr.; and Lim, Khoon C., 4,944,576, Cl. 350-334.000.

Marin, M. James: *See*—
Lilly, Norman R.; Marin, M. James; and Field, Michael E., 4,944,827, Cl. 156-384.000.

Marinus, Antonius A. M.; Miermans, Hubertus C.; and De Bondt, Guy L. P., to U.S. Philips Corporation. Switched-mode power supply circuit. 4,945,465, Cl. 363-89.000.

Markowski, Robert G.: *See*—
Sabatella, Robert J.; Mrowka, Joseph J.; McCuin, Jon P.; Robarge, Dean A.; Perzan, Denis A.; Markowski, Robert G.; and Reid, David A., 4,945,450, Cl. 361-334.000.

Marquis, Andre L.: *See*—
Bodick, Neil; and Marquis, Andre L., 4,945,476, Cl. 364-413.020.

Marrocco, Matthew L., III, to Maxdem Incorporated. Electrically settable resistance device. 4,945,257, Cl. 307-201.000.

Mars Incorporated: *See*—
Deaville, David C., 4,945,558, Cl. 379-144.000.

Marsden, George P.: *See*—
Velke, David C., Sr.; Marsden, George P.; and Leffingwell, Burton C., 4,944,699, Cl. 439-784.000.

Marshall, William B.; Pribish, James R.; and Brewbaker, James L., to Dow Chemical Company, The. Melt processable thermotropic aromatic copolyester derived from hydroxy phenoxy benzoic acids and hydroxy benzoic acid. 4,945,150, Cl. 528-193.000.

Martin Engineering Company: *See*—
Swinderman, Robert T., 4,944,386, Cl. 198-499.000.

Martin, Francis J.: *See*—
Uster, Paul S.; Fielding, Robert M.; and Martin, Francis J., 4,944,948, Cl. 424-450.000.

Martin, Konrad: *See*—
Schlomm, Hartmut; and Martin, Konrad, 4,944,912, Cl. 376-420.000.

Martin, Michael L.: *See*—
Morris, Merle E.; Martin, Michael L.; Neff, Louis D.; and Kendrick, George B., 4,945,288, Cl. 313-25.000.

Martinez, David M.; Carignan, Roger G.; and Stulberg, S. David. Modulator knee prosthesis system. 4,944,757, Cl. 623-20.000.

Martinray Industries Ltd.: *See*—
Labelle, H. M. Robert; Cant, Norman H.; and Garrow, Cecil M., 4,944,169, Cl. 70-100.000.

Maruyama, Hisao: *See*—
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, 4,944,988, Cl. 428-195.000.

Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, to Seiko Epson Corporation. Page printer. 4,945,364, Cl. 346-160.000.

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Nonaka, Haruo, 4,944,492, Cl. 254-104.000.

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Kajino, Hideo; and Matsuo, Kazuo, 4,944,324, Cl. 137-113.000.

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Kubo, Kiyoshi; Okamura, Noboru; and Morikura, Susumu, 4,945,403, Cl. 358-13.000.
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Edwards, M. Earl; and May, James G., 4,944,646, Cl. 414-332.000.

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Okino, Yoshinori; Noguchi, Naoyuki; Kita, Tatsuya; and Shigemura, Takuro, 4,944,199, Cl. 74-858.000.

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Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
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Keevert, John E., Jr.; McDugle, Woodrow G.; and Eachus, Raymond S., 4,945,035, Cl. 430-567.000.

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Mallory, Thomas H.; McTighe, Timothy; and Noiles, Douglas G., 4,944,759, Cl. 623-22.000.

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Felton, Clinton D.; Gibson, Baylor D.; Jamison, Charles E.; McWhorter, William O.; and Serad, George A., 4,944,854, Cl. 204-168.000.

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Powell, Anthony D., 4,944,919, Cl. 422-26.000.

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Mead, Peter L., to Lin Pac Mouldings Limited. Frame structure. 4,944,404, Cl. 206-600.000.

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Doan, Phong D.; Cobian, Kenneth E.; Upton, James E.; and Haeg, Daniel C., 4,944,088, Cl. 29-858.000.

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Buchbinder, Maurice; and Solar, Ronald J., 4,944,740, Cl. 606-194.000.

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Lautner, Max; Hoffman, Fred; and Melnikov, Edward, 4,944,085, Cl. 29-732.000.

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Gradoboev, Vladimir T.; Melnikov, Leonid I.; Klimenov, Alexandr M.; and Sitnikov, Alexandr E., 4,944,382, Cl. 198-399.000.

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Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin,

William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.

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Teumer, Christopher R.; and Mendes, Mark A., 4,945,555, Cl. 379-21.000.

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Baldwin, John J.; Remy, David C.; and Claremon, David A., 4,945,182, Cl. 564-349.000.

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Steiner, Kurt, 4,945,085, Cl. 514-53.000.

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Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Merten, Josef, 4,945,124, Cl. 525-63.000.

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Kallies, Guenter; and Lessat-Kaupat, Wolfgang, 4,944,473, Cl. 244-129.500.
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Ototani, Tohei, 4,944,798, Cl. 420-85.000.

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Piper, James A., 4,945,545, Cl. 372-87.000.

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Sorg, Helmut; Pieper, Helmut; Zschocher, Hartmut; and Merlet, Heinz, 4,944,785, Cl. 65-136.000.

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Gerstenberg, Bruno; Michling, Hans J.; and Vachek, Josef, 4,945,323, Cl. 333-185.000.

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Wallach, Donald F. H., 4,944,734, Cl. 604-358.000.

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Thompson, Ted L., 4,944,446, Cl. 228-102.000.

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Heyes, Peter J.; and Middleton, Nicholas J., 4,945,008, Cl. 428-623.000.

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Steuck, Michael J., 4,944,879, Cl. 210-500.270.

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Gaignet, Yves, 4,944,875, Cl. 210-232.000.

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Henderson, Martin C.; Koerner, Ralph J.; and Jordan, William D., Jr., 4,945,356, Cl. 340-941.000.
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Riedel, John E.; and Olsen, Frederick O., 4,944,040, Cl. 2-15.000.

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Katoh, Takehiro; Nishimura, Shinichi; and Ishimura, Toshihiko, 4,945,380, Cl. 354-443.000.
Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Ishimura, Toshihiko; and Katayori, Sinji, 4,945,370, Cl. 354-173.110.
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.
Tange, Keigo; Kanada, Tomohisa; and Hirota, Shingo, 4,945,388, Cl. 355-296.000.

Mishima, Yoshibumi: *See*—
Hasegawa, Shumpei; Takahashi, Yasushi; and Mishima, Yoshibumi, 4,944,266, Cl. 123-302.000.

Mistrorigo, Mario; Barcaro, Massimo; and Faccin, Andrea, to Miteni S.r.L. Process for producing nitrosyl fluoride. 4,944,931, Cl. 423-386.000.

Misumi, Atsushi: *See*—
Yoneshige, Yasuo; Misumi, Atsushi; Hiromoto, Shuji; and Sakai, Toru, 4,944,992, Cl. 428-198.000.

Mita Industrial Co., Ltd.: *See*—
Yamada, Syuji; and Andou, Hironori, 4,945,384, Cl. 355-51.000.

Mitamura, Kazuhiro, to Nissan Motor Co., Ltd. CAD/CAM plotting system by one-stroke sketching. 4,945,498, Cl. 364-521.000.

Miteni S.r.L.: *See*—
Mistrorigo, Mario; Barcaro, Massimo; and Faccin, Andrea, 4,944,931, Cl. 423-386.000.

Mitsubihsi Denki Kabushiki Kaisha: *See*—
Sakamura, Ken; and Kobayashi, Souichi, 4,945,472, Cl. 364-200.000.

Mitsubishi Cable Industries, Ltd.: *See*—
Sukegawa, Tokuzo; and Tadatomo, Kazuyuki, 4,944,811, Cl. 148-33.100.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujimoto, Takanori; and Hara, Toshiro, 4,945,485, Cl. 364-431.050.
Hosotani, Osamu; Kawauchi, Koichi; and takahashi, Naoki, 4,945,535, Cl. 371-11.100.
Ikeuchi, Masayuki; and Okamura, Kouichi, 4,945,232, Cl. 250-231.140.
Itoh, Hisatsugu; and Kawabata, Munehiro, 4,945,336, Cl. 340-438.000.

Itomitsu, Fujio; and Yoshida, Toyohiko, 4,945,511, Cl. 364-900.000.
Iwata, Shigemi, 4,944,369, Cl. 187-105.000.
Iwata, Toshio; and Ohkubo, Satoru, 4,944,271, Cl. 123-435.000.
Iwatani, Shiro; and Kitamura, Yutaka, 4,945,277, Cl. 340-455.000.
Kaneko, Kouichi, 4,945,540, Cl. 371-57.100.
Kawamura, Yasukazu, 4,945,350, Cl. 340-784.000.
Komurasaki, Satoai, 4,944,179, Cl. 73-35.000.
Kuroda, Shigenori; and Takechi, Moriaki, 4,945,446, Cl. 361-146.000.
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Yamasaki, Hiroyuki; Konishi Yasuhiro; and Ikeda, Yuto, 4,945,517, Cl. 365-189.010.
Mori, Satoshi, 4,945,266, Cl. 307-570.000.
Morishita, Akira; and Isozumi, Shuzoo, 4,944,192, Cl. 74-6.000.
Nakamura, Masakatsu; and Hieda, Sayuki, 4,945,204, Cl. 219-121.690.
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,945,235, Cl. 250-306.000.
Ochi, Daisuke; Yoshida, Yasuhiro; and Iwaki, Yoshiyuki, 4,945,272, Cl. 310-91.000.
Okamoto, Kyoichi, 4,945,270, Cl. 310-88.000.
Sanai, Yukiharu, 4,945,349, Cl. 340-784.000.
Sugihara, Kazuyoshi; and Arinobu, Ichiro, 4,945,329, Cl. 335-219.000.
Tada, Shoji; Sugio, Toshiko; and Nakashima, Kuniaki, 4,945,256, Cl. 307-139.000.
Takahara, Toshiyuki; and Takami, Akira, 4,944,718, Cl. 475-16.000.
Tanaka, Toshiaki; Nishikawa, Morihisa; Ozaki, Yoshio; Akamatsu, Kooji; Nakata, Masahiro; and Taneda, Atsushi, 4,945,199, Cl. 219-69.130.
Toda, Haruhisa; Fujihisa, Hiroaki; and Murata, Shiro, 4,945,325, Cl. 335-16.000.
Ueda, Masahiro, 4,945,513, Cl. 365-51.000.
Watanabe, Hirofumi, 4,945,299, Cl. 322-33.000.
Yagoura, Hideya; and Yamamoto, Isamu, 4,945,391, Cl. 357-19.000.
Yamamoto, Katsuharu, 4,944,156, Cl. 62-324.600.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Ohya, Kazuyuki; and Kimbara, Hidenori, 4,944,373, Cl. 188-251.00A.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Katayama, Hideaki; Hasegawa, Akira; and Sakaguchi, Katsuyoshi, 4,944,951, Cl. 425-58.100.
Motai, Toshiki; and Kashiwazaki, Masamichi, 4,944,252, Cl. 122-470.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Matsumoto, Tatsumi, 4,944,650, Cl. 414-757.000.
Takahashi, Hiroyuki; and Shiratori, Yoshitaka, 4,944,121, Cl. 51-267.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Miyabayashi, Mitsutaka; Nishii, Toshifumi; Yui, Hiroshi; Inada, Kuniaki; Ikeda, Katsuji; Nose, Hiroyoshi; and Tsuchiya, Kenji, 4,945,014, Cl. 429-218.000.

Mitsuboshi Belting Ltd.: *See—*
Ueda, Seitaro; Okubo, Yukio; Izumi, Shinichiro; and Hoshiro, Takeshi, 4,944,715, Cl. 474-245.000.

Mitsubuishi Kasei: *See—*
Arita, Yoji, 4,945,330, Cl. 335-229.000.

Miura, Masakatsu: *See—*
Ozaki, Kazuhisa; and Miura, Masakatsu, 4,944,376, Cl. 192-17.00A.

Miura, Toshihide: *See—*
Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, 4,944,504, Cl. 271-171.000.

Miyabayashi, Mitsutaka; Nishii, Toshifumi; Yui, Hiroshi; Inada, Kuniaki; Ikeda, Katsuji; Nose, Hiroyoshi; and Tsuchiya, Kenji, to Mitsubishi Petrochemical Co., Ltd.; and Toshiba Battery Co., Ltd. Secondary battery. 4,945,014, Cl. 429-218.000.

Miyake, Toshiro: *See—*
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.

Miyama, Masayoshi; and Komori, Hiroki, to Kinugawa Rubber Industrial Co., Ltd. Coating composition for treating surface of high molecular elastic material. 4,945,123, Cl. 524-269.000.

Miyano, Osamu: *See—*
Matsuura, Shinichi; and Miyano, Osamu, 4,945,186, Cl. 568-433.000.

Miyashita, Kunio: *See—*
Nihei, Hideki; Miyashita, Kunio; and Asano, Hideki, 4,945,268, Cl. 310-12.000.

Miyata, Yoshiyuki: *See—*
Suzuki, Toshimitsu; Sakaguchi, Masakazu; Miyata, Yoshiyuki; and Mori, Tomoyuki, 4,945,102, Cl. 514-398.000.

Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Yamasaki, Hiroyuki; Konishi Yasuhiro; and Ikeda, Yuto, to Mitsubishi Denki Kabushiki Kaisha. Dynamic random access memory. 4,945,517, Cl. 365-189.010.

Miyatani, Takao: *See—*
Ohya, Hideshi; Miyatani, Takao; Kawamura, Keiji; and Kawabata, Yasutomo, 4,945,231, Cl. 250-231.140.

Miyazaki, Akihiko: *See—*
Hisamichi, Yasushi; and Miyazaki, Akihiko, 4,945,366, Cl. 354-62.000.

Mizuno, Toshiaki, to Nidek Co., Ltd. Device for measuring pupillary distance. 4,944,585, Cl. 351-204.000.

Mizunuma, Yasuyuki: *See—*
Murakami, Yoshikazu; Ohgihara, Takahiro; Niikura, Kanako; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,945,324, Cl. 333-202.000.

MK-Ferguson Company: *See—*
Renner, James S., 4,944,444, Cl. 228-59.000.

Mladenoff, Donald D.: *See—*
Carver, Larry L.; Zamzow, Charles E.; Mladenoff, Donald D.; and Lovrien, Glenn A., 4,945,488, Cl. 364-474.240.

Mobay Corporation: *See—*
Brown, Karen K.; and Bryant, Sharon A., 4,944,942, Cl. 424-89.000.

Mobil Oil Corporation: *See—*
Chen, Nai Y.; Ketkar, Anil B.; and Partridge, Randall D., 4,944,862, Cl. 208-49.000.
Liu, Leland L.; and Cyr, Patricia A., 4,944,990, Cl. 428-353.000.
Rosa, Mark S., 4,944,081, Cl. 29-235.000.
Smith, C. Morris; and Walsh, Dennis E., 4,944,863, Cl. 208-107.000.

Mobil Solar Energy Corporation: *See—*
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., 4,945,065, Cl. 437-4.000.

Mobley, George A., to Milliken Research Corporation. Laminator unwind roll stand. 4,944,470, Cl. 242-58.400.

Mocchi, Patrick: *See—*
Auger, Gerard; Laurent, Pierre A.; and Mocchi, Patrick, 4,945,312, Cl. 329-345.000.

Mochizuki, Akio: *See—*
Serizawa, Hiroyuki; and Mochizuki, Akio, 4,945,453, Cl. 362-61.000.

Mochizuki, Seiji: *See—*
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,945,364, Cl. 346-160.000.

Moen, Darcy A.: *See—*
Moen, Harold W.; and Moen, Darcy A., 4,944,436, Cl. 223-98.000.

Moen, Harold W.; and Moen, Darcy A. Garment hanger cover. 4,944,436, Cl. 223-98.000.

Mogami, Akinori; and Naitoh, Motohiro, to Jeol Ltd. Direct imaging type SIMS instrument having TOF mass spectrometric mode. 4,945,236, Cl. 250-309.000.

Moisan, Monique; Pavy, Dominique; Davoust, Marie-Eve; Saada, Serge; and Chollet, Patrick, to Etat Francais Represente Par Le Ministere Des Postes. Apparatus for the production of preforms for optical fibers. 4,944,244, Cl. 118-723.000.

Mokry, Patti J., to Kimberly-Clark Corporation. Shaped napkin with elasticized edges. 4,944,735, Cl. 604-385.200.

Molecular Probes, Inc.: *See—*
Haugland, Richard P.; and Whitaker, James, 4,945,171, Cl. 549-224.000.

Molex Incorporated: *See—*
Danbach, Philip J.; and Sampson, Stephen, 4,944,568, Cl. 350-96.200.

Molina, Richard W.; Cortina, Manuel; Bertolina, Roberto; and Balsa, Luis H., to INASA Automotive, Inc. Rotative combustion chamber engine. 4,944,262, Cl. 123-190.0BD.

Molins PLC: *See—*
Bolt, Reginald C., 4,944,314, Cl. 131-280.000.

Momoki, Yasuhito; Hioki, Takanori; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,945,038, Cl. 430-576.000.

Monsanto Company: *See—*
Hardiman, Christopher J.; and Bowers, Gary R., 4,945,143, Cl. 526-206.000.

Montijn, Andreas N.: *See—*
Ten Bruggencate, Cornelis A.; Montijn, Andreas N.; and Van Keimpema, Gerrit J., 4,944,399, Cl. 206-509.000.

Moog Inc.: *See—*
Cardin, Joseph M.; Fremy, Raoul; and Griffin, Patrick K., 4,944,329, Cl. 137-614.050.

Moore, Milton D. Shaving preparation for treatment and prevention of PFB (Ingrown Hairs). 4,944,939, Cl. 424-73.000.

Moran, Edward F., Jr., to Du Pont de Nemours, E. I., and Company. Process for the preparation of 4-phenylquinol. 4,945,183, Cl. 568-309.000.

Morgan Construction Company: *See—*
Salter, Lowell S., Jr.; Simmons, Thomas E.; and Innis, Charles L., Jr., 4,944,609, Cl. 384-118.000.

Morgan, Mary A.: *See—*
Eldridge, John D., Jr.; and Morgan, Mary A., 4,944,311, Cl. 128-849.000.

Morgen, Helmut: *See—*
Kortgen, Bernd; Morgen, Helmut; Heinrichs, Heinz-Josef; Fuhrmann, Castor; and Freitag, Herbert, 4,944,498, Cl. 267-64.110.

Mori, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Composite semiconductor device. 4,945,266, Cl. 307-570.000.

Mori, Shigeo: *See—*
Sato, Tutomu; Yura, Haruhiko; Nasu, Yoshihiko; Fujiwara, Atsumi; and Mori, Shigeo, 4,945,317, Cl. 330-301.000.

Mori, Tomoyuki: *See—*
Suzuki, Toshimitsu; Sakaguchi, Masakazu; Miyata, Yoshiyuki; and Mori, Tomoyuki, 4,945,102, Cl. 514-398.000.

Mori, Yoshihiro: *See—*
Tsuchiya, Mitsuo; Matsubara, Masafumi; Mori, Yoshihiro; and Itami, Hideo, 4,944,283, Cl. 126-41.00R.

Morikura, Susumu: *See—*
Kubo, Kiyoshi; Okamura, Noboru; and Morikura, Susumu, 4,945,403, Cl. 358-13.000.

Morishita, Akira; and Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Starter for an internal combustion engine. 4,944,192, Cl. 74-6.000.

Morland, Albert H.; and Warren, Timothy J., to CooperVision, Inc. Process and apparatus for casting lenses. 4,944,899, Cl. 264-1.400.

Morris, James K. Hull for water craft. 4,944,240, Cl. 114-283.000.

Morris, Merle E.; Martin, Michael L.; Neff, Louis D.; and Kendrick, George B., to GTE Products Corporation. Double jacket lamp. 4,945,288, Cl. 313-25.000.

Morrision, Richard H., Jr.: *See*—
Allen, Lisa P.; Vu, Duy-Phach; Batty, Michael W.; Morrision, Richard H., Jr.; and Zavracky, Paul M., 4,944,835, Cl. 156-620.700.

Morrison, Robert C.: *See*—
Mehta, Vijay C.; Rathman, Terry L.; Sanchez, Ramiro; and Morrison, Robert C., 4,944,894, Cl. 252-182.120.

Morrison, William A.: *See*—
Singh, Raj N.; and Morrison, William A., 4,944,904, Cl. 269-60.000.

Moser, Hans; Bohner, Beat; and Fory, Werner, to Ciba-Geigy Corporation. 1,5-diphenylpyrazole-3-carboxylic acid derivatives for the protection of cultivated plants. 4,944,790, Cl. 71-92.000.

Mosier, Arthur R. Swim fin having multiple articulating transverse hydrofoil blades. 4,944,703, Cl. 441-62.000.

Motai, Toshiki; and Kashiwazaki, Masamichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Reheat type exhaust gas boiler. 4,944,252, Cl. 122-470.000.

Motorola, Inc.: *See*—
Blanchette, Jeffrey J., 4,945,355, Cl. 340-825.060.
Gerson, Ira A.; and Lindsley, Brett L., 4,945,570, Cl. 381-110.000.
McGinn, Michael, 4,945,415, Cl. 358-195.100.
Thome, John R., 4,944,447, Cl. 228-103.000.
Wilson, Lance G., 4,945,319, Cl. 333-33.000.
Wrzesinski, Stanley, 4,945,358, Cl. 361-42.000.

Motsinger, Russell E.; and Vdoviak, John W., to General Electric Company. Closed cavity noise suppressor. 4,944,362, Cl. 181-213.000.

Mourey, Bruno: *See*—
Aigrain, Pierre; Mourey, Bruno; Dubois, Jean C.; Hareng, Michel; and Robin, Philippe, 4,944,575, Cl. 350-333.000.

Mowli, John C. Two-stage pumping apparatus with low shear first stage. 4,944,657, Cl. 417-203.000.

Moy, Michael E.: *See*—
Munro, Frederick G.; Beavers, Kelly J.; Korngiebel, Ronald W.; Lucchesi, Raymond L.; and Moy, Michael E., 4,945,429, Cl. 360-92.000.

Moyet-Ortiz, Francisco. Portable vehicle garage and tent structure. 4,944,321, Cl. 135-88.000.

Mrowka, Joseph J.: *See*—
Sabatella, Robert J.; Mrowka, Joseph J.; McCuin, Jon P.; Robarge, Dean A.; Perzan, Denis A.; Markowski, Robert G.; and Reid, David A., 4,945,450, Cl. 361-334.000.

MTU Motoren- und Turbinen-Union Munich GmbH: *See*—
Merz, Herbert, 4,944,655, Cl. 416-61.000.

Mueller, Rudolf: *See*—
Blumbach, Gotz-Peter; Brueckner, Willi; and Mueller, Rudolf, 4,944,080, Cl. 29-33.00A.

Mueller, Wolfgang; and Nagare, Arthur T., to American Sterilizer Company. Translation lock for surgical table with displaceable tabletop. 4,944,500, Cl. 269-322.000.

Muggee, John M.; and Zilley, Eric L., to Minnesota Mining and Manufacturing Company. Low odor adhesive compositions and bonding method employing same. 4,945,006, Cl. 428-500.000.

Mugler, John P., III: *See*—
Merickel, Michael B.; Carman, Charles S.; Brookeman, James R.; Mugler, John P., III; and Ayers, Carlos R., 4,945,478, Cl. 364-413.220.

Muka, John: *See*—
Raterman, Donald E.; and Muka, John, 4,944,462, Cl. 241-100.000.

Mukai, Hiromichi: *See*—
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.

Muller, Fritz. Apparatus for heating fuel. 4,944,343, Cl. 165-47.000.

Muller, Hanns-Peter: *See*—
Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, 4,945,137, Cl. 525-375.000.

Muller, Horst: *See*—
Hille, Hans-Dieter; Muller, Horst; and Dobbelstein, Arnold, 4,945,128, Cl. 524-591.000.

Muller, Klaus R., to Karl Thomae GmbH. Process for preparing enantiomerically pure propan-1,2-diols. 4,945,187, Cl. 568-868.000.

Muller, Peter, to Deutsche Voest-Alpine Industrieanlagenbau GmbH. Process for cooling heated material. 4,944,174, Cl. 72-201.000.

Mullner, Josef: *See*—
Flamig, Hans; Schutte, Andreas; Schiel, Christian; Steiner, Karl; and Mullner, Josef, 4,944,089, Cl. 29-895.220.

Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, to Petroleo Brasileiro S.A. - Petrobras. Process to secure oil, gas, and by-products from pyrobetuminous shale and other matter impregnated with hydrocarbons. 4,944,867, Cl. 208-409.000.

Munro, Frederick G.; Beavers, Kelly J.; Korngiebel, Ronald W.; Lucchesi, Raymond L.; and Moy, Michael E., to Storage Technology Corporation. Data security arrangement for an automated magnetic tape cartridge library system. 4,945,429, Cl. 360-92.000.

Murachi, Tatsuya, to Toyoda Gosei Co., Ltd. Adhesive composition. 4,945,016, Cl. 524-81.000.

Muraishi, Kstsuaki, to Fuji Photo Film Co., Ltd. Apparatus for loading sheet-shaped material. 4,945,238, Cl. 250-327.200.

Murakami, Shohei: *See*—
Watanabe, Shingo; and Murakami, Shohei, 4,944,616, Cl. 400-105.000.

Murakami, Yoshihiro: *See*—
Tsuji, Masanori; Murakami, Yoshihiro; and Yamanashi, Makoto, 4,944,695, Cl. 439-595.000.

Murakami, Yoshikazu; Ohgihara, Takahiro; Niikura, Kanako; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, to Sony Corporation. Thin film ferromagnetic resonance tuned filter. 4,945,324, Cl. 333-202.000.

Muramatsu, Kunio; and Suzuki, Seigo, to Kabushiki Kaisha Toshiba. Line memory for speed conversion. 4,945,518, Cl. 365-233.000.

Muraoka, Yutaka: *See*—
Kurakake, Mitsuo; Otsuka, Shoichi; and Muraoka, Yutaka, 4,945,496, Cl. 364-518.000.

Murasaki, Akira; and Hashimoto, Masayuki, to Nissan Motor Co., Ltd.; and Nissan Kohki Co., Ltd. Chain casing for engine. 4,944,264, Cl. 123-195.00C.

Murasaki, Akira: *See*—
Nagano, Seishi; Hashimoto, Masayuki; and Murasaki, Akira, 4,944,263, Cl. 123-193.00H.

Murata Manufacturing Co., Ltd.: *See*—
Okumura, Mitsunao, 4,945,322, Cl. 333-184.000.
Sakamoto, Yukio; Zushi, Mamoru; and Bando, Masahiro, 4,945,332, Cl. 336-69.000.

Murata, Shiro: *See*—
Toda, Haruhisa; Fujihisa, Hiroaki; and Murata, Shiro, 4,945,325, Cl. 335-16.000.

Murata, Yoshitaka: *See*—
Date, Nobuaki; Sunouchi, Akio; Saito, Syuichiro; Murata, Yoshitaka; Ogawa, Yukio; and Tezuka, Nobuo, 4,945,379, Cl. 354-441.000.

Murphy, Edward J.; Ansel, Robert E.; and Krajewski, John J., to DeSoto, Inc. Stereolithography using repeated exposures to increase strength and reduce distortion. 4,945,032, Cl. 430-394.000.

Murphy, Kenneth S.; Hendricks, Robert E.; and Fenton, Richard J., to United Technologies Corporation. Method for applying diffusion aluminide coating. 4,944,858, Cl. 204-192.150.

Murray, Thomas L., Jr.: *See*—
Holtey, Thomas O.; Murray, Thomas L., Jr.; Smith, Scott W.; and Perzan, Wayne A., 4,945,473, Cl. 364-200.000.

Murthy, Malalur V.: *See*—
Luxon, Bruce A.; and Murthy, Malalur V., 4,944,965, Cl. 427-389.700.

Mushiage, Masato: *See*—
Tanaka, Haruo; Mushiage, Masato; and Ishida, Yuhji, 4,944,246, Cl. 118-729.000.

Mutoh, Hideki, to Fuji Photo Film Co., Ltd. Solid state image pickup apparatus with charge storage device. 4,945,418, Cl. 358-213.110.

Myklebust, Eirik; and Rasmussen, Odd F., to Norsk Hydro a.s. Flexible container comprising several lifting means. 4,944,604, Cl. 383-7.000.

Mylvaganam, Kanagasaba; and Hammer, Erling, to Den Norske Stats Oljeselskap A.S. Transducer for arranging in a fluid, particularly for the measurement of the flow-velocity of a fluid in a pipe, by transmitting/receiving sonic pulses. 4,945,276, Cl. 310-326.000.

Myre, William W., Jr.: *See*—
Elliott, Linda C.; Horn, Gary R.; Jordan, Lloyd E., II; Levine, Frank E.; Shih, Cheng-Fong; and Myre, William W., Jr., 4,945,474, Cl. 364-200.000.

Myuftiev, Valcho P.: *See*—
Lyakov, Nedyalko K.; Haralampiev, Georgi A.; Nikolov, Todor G.; Buyukliev, Georgi S.; Petrov, Peter S.; Valchev, Peter V.; Myuftiev, Valcho P.; and Primov, Kalin T., 4,944,869, Cl. 209-173.000.

N. V. Raychem S. A.: *See*—
Cordia, Johannes M.; Evans, Roger W.; and Van Loo, Robert H., 4,944,987, Cl. 428-192.000.

Nabae, Kiyoyuki: *See*—
Shiromoto, Keigo; Adachi, Yasuo; and Nabae, Kiyoyuki, 4,944,932, Cl. 423-447.600.

Nadkarni, Ravindra M.: *See*—
Alexander, Guy B.; and Nadkarni, Ravindra M., 4,944,985, Cl. 428-570.000.

Nagahira, George: *See*—
Suzuki, Koji; Nagahira, George; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,945,255, Cl. 307-17.000.

Nagano, Seishi; Hashimoto, Masayuki; and Murasaki, Akira, to Nissan Motor Co., Ltd.; and Nissan Kohki Co., Ltd. Cylinder head of DOHC engine. 4,944,263, Cl. 123-193.00H.

Nagaoka, Shinji; Seki, Yoichi; Saito, Hiroyuki; and Taniwaki, Michio, to Seikosha Co., Ltd. Circuit for detecting back light. 4,945,378, Cl. 354-429.000.

Nagare, Arthur T.: *See*—
Mueller, Wolfgang; and Nagare, Arthur T., 4,944,500, Cl. 269-322.000.

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Nakagawa, Kazumichi: *See*—
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Kikuchi, Masakazu; Yoshimura, Koji; and Nakahama, Kazuo, 4,945,051, Cl. 435-172.300.

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Murakami, Yoshikazu; Ohgihara, Takahiro; Niikura, Kanako; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,945,324, Cl. 333-202.000.

Nakano, Isamu: *See*—
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Tanaka, Hatsuyuki; Kobayashi, Masakazu; Wakiya, Kazumasa; and Nakayama, Toshimasa, 4,944,893, Cl. 252-171.000.

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Namekawa, Makoto, to Alpine Electronics Inc. Method of locking function of mobile telephone system. 4,945,556, Cl. 379-58.000.

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Sommers, Valerie D., 4,944,710, Cl. 446-329.000.

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Rogers, Alan J., 4,944,571, Cl. 350-96.290.

National Semiconductor Corporation: *See*—
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Estrada, Julio R., 4,945,265, Cl. 307-455.000.
Wright, Michael E., 4,945,261, Cl. 307-443.000.

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Lyakov, Nedyalko K.; Haralampiev, Georgi A.; Nikolov, Todor G.; Buyukliev, Georgi S.; Petrov, Peter S.; Valchev, Peter V.; Myuftiev, Valcho P.; and Primov, Kalin T., 4,944,869, Cl. 209-173.000.

NCR Corporation: *See*—
Tribert, John, 4,944,617, Cl. 400-157.200.
Watanabe, Shingo; and Murakami, Shohei, 4,944,616, Cl. 400-105.000.

Nebelung, Hermann H.; and Ruschau, Walter, to Emhart Industries, Inc. Single shear blade mechanism for gob severing. 4,944,207, Cl. 83-162.000.

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Ideta, Yorihiko, 4,944,618, Cl. 400-211.000.
Ishida, Ryuji; and Kiuchi, Toyoo, 4,945,507, Cl. 364-737.000.
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Sato, Toshifumi; and Ide, Motoki, 4,945,300, Cl. 323-318.000.
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Neches, Philip M., to Teradata Corporation. Message transmission system for selectively transmitting one of two colliding messages based on contents thereof. 4,945,471, Cl. 364-200.000.

Neff, Louis D.: *See*—
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Nei Canada Limited: *See*—
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Neilsen & Hiebert Systems, Inc.: *See*—
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Nelms, C. Randall, Jr.: *See*—
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Nelson, Bruce A.: *See*—
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Nelson, Donald A.: *See—*
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Nelson, John; and Tosi, Robert B., to Watts FluidAir Div. of Robertshaw Controls Company. Injection lubricator with plural outlets. 4,944,367, Cl. 184-29.000.
Neumeyer, Richard E.: *See—*
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Newnham, Robert E.: *See—*
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Newth, Gregory L.; and Newth, Alice C. S. Pain therapy tool and method. 4,944,747, Cl. 606-204.000.
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Ng, Yee S., to Eastman Kodak Company. False density contour suppression using stored random probabilities to form print/no-print decisions. 4,945,422, Cl. 358-298.000.
NGK Spark Plug Co., Ltd.: *See—*
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Nonoyama, Osamu; and Kato, Masahiro, 4,944,983, Cl. 428-81.000.
NHK Spring Co., Ltd.: *See—*
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Nickens, Dan A.: *See—*
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Nielsen, Edward G.; and Sterenwyk, Timothy E., to Laser Alignment, Inc. Apparatus and method for controlling a hydraulic excavator. 4,945,221, Cl. 250-203.100.
Nielsen, Norman A., to Xerox Corporation. Electrostatographic recording material. 4,944,997, Cl. 428-327.000.
Niemczyk, Robert T.: *See—*
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Nieves, Anthony L.: *See—*
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Niggemann, Richard E., to Sundstrand Corporation. Flow control apparatus and method. 4,944,163, Cl. 62-500.000.
Niggli, Peter: *See—*
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Niki, Hiroshi: *See—*
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Nikolov, Todor G.: *See—*
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Nilsson, Bo. Method for regulating the working and the output of plastic material in extrusion moulding. 4,944,903, Cl. 264-40.100.
Nilsson, Karl E.; and Zeuner, Siegfried, to Bayern-Chemie, Gesellschaft fur flugchemische Antriebe mbH. Automatic-ignition device for vehicle crash protection device. 4,944,528, Cl. 280-741.000.
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Nippon Petrochemical Co., Ltd.: *See—*
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Nippon Seiko Kabushiki Kaisha: *See—*
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Nippon Sheet Glass Co., Ltd.: *See—*
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Nishida, Akira: *See—*
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Nishikawa, Morihisa: *See—*
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Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Transmission control system. 4,945,482, Cl. 364-424.100.
Nishikawa, Tomohisa; and Oshima, Kazuo, to Bridgestone Corporation. Adhesive treatment for nylon cords. 4,944,821, Cl. 156-161.000.
Nishimura, Shinichi: *See—*
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Nishina, Teruya. Electronic sphygmomanometer. 4,944,304, Cl. 128-667.000.
Nishino, Hideo; Hattori, Tatsuya; Kushida, Tsuneharu; and Kumata, Masataka, to Honda Giken Kogyo Kabushiki Kaisha. Method of producing prepolymer of aromatic polythiazole in the presence of a phosphoric acid compound. 4,945,153, Cl. 528-337.000.
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Fine adjustment mechanism for a scanning tunneling microscope. 4,945,235, Cl. 250-306.000.
Nishizawa, Hideyuki. Apparatus for forming fiber reinforced slab gel for use in electrophoresis. 4,944,483, Cl. 249-83.000.
Nissan Chemical Industries, Ltd.: *See—*
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Nissan Motor Company, Ltd.: *See—*
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Nitschke, Werner; Weller, Hugo; and Drobny, Wolfgang, to Robert Bosch GmbH. Multi-computer synchronization system and method. 4,945,486, Cl. 364-431.110.
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Niwata, Shinjiro: *See—*
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Nonaka, Haruo, to Matsuo Engineering Co., Ltd. Wedge-type jack apparatus for raising structure while sustaining very large pressure due to same and temporarily supporting the structure. 4,944,492, Cl. 254-104.000.
Nonaka, Shiro; Hagino, Seiichiro; and Ando, Tsukasa, to Aisin Seiki Kabushiki Kaisha. Detecting device of the feeding quantity in a sewing machine. 4,944,237, Cl. 112-315.000.
Nonaka, Yoshiya: *See—*
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Nordqvist, Karl G., to Tecator AB. Method of reducing the susceptibility to interference of a measuring instrument. 4,944,589, Cl. 356-326.000.
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Norman Oksman: *See—*
Packman, Elias W., 4,945,084, Cl. 514-53.000.
Norsk Hydro A.S.: *See—*
Linga, Hogne; and Eliassen, Carlo, 4,944,672, Cl. 432-3.000.
Myklebust, Eirik; and Rasmussen, Odd F., 4,944,604, Cl. 383-7.000.
North American Manufacturing Co.: *See—*
Wasson, James E., 4,944,670, Cl. 431-166.000.
North American Philips Corporation: *See—*
Cavallerano, Alan P.; Basile, Carlo; and Tsinberg, Mikhail, 4,945,411, Cl. 358-141.000.
North Carolina State University: *See—*
Palmour, John W.; and Edmond, John A., 4,945,394, Cl. 357-34.000.
Northern Telecom Limited: *See—*
Hancu, Marius, 4,945,536, Cl. 371-22.300.
Northrop Corporation: *See—*
Carver, Larry L.; Zamzow, Charles E.; Mladenoff, Donald D.; and Lovries, Glenn A., 4,945,488, Cl. 364-474.240.
Norton Company: *See—*
Rue, Charles V.; Pukaite, [illegible]nard G.; and Subramanian, Krishnamoorthy, 4,944,773, Cl. 51-307.000.
Nose, Hiroyoshi: *See—*
Miyabayashi, Mitsutaka; Nishii, Toshifumi; Yui, Hiroshi; Inada, Kuniaki; Ikeda, Katsuji; Nose, Hiroyoshi; and Tsuchiya, Kenji, 4,945,014, Cl. 429-218.000.
Nouvertne, Werner: *See—*
Genz, Joachim; Dicke, Hans-Rudolf; Grigo, Ulrich; and Nouvertne, Werner, 4,945,130, Cl. 525-67.000.
Novack, Mitchell J.: *See—*
Blake, Graeme A.; Norling, Brian L.; and Novack, Mitchell J., 4,944,184, Cl. 73-514.000.
Novak, Bruce M.: *See—*
Grubbs, Robert H.; and Novak, Bruce M., 4,945,135, Cl. 525-338.000.
Grubbs, Robert H.; and Novak, Bruce M., 4,945,141, Cl. 526-90.000.
Grubbs, Robert H.; and Novak, Bruce M., 4,945,144, Cl. 526-268.000.
Nowakowski, Mark A.; and Bell, Ailyn R., to Uniroyal Chemical Company, Inc. herbicidal sulfonamide derivatives. 4,945,113, Cl. 514-605.000.
Numata, Tatsuo: *See—*
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatruo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.
Nutra Sweet Company, The: *See—*
Hill, John B.; Dryden, Hugh L., Jr.; and Erickson, Robert, 4,945,172, Cl. 549-253.000.
Nyfeler, Robert; Zondler, Helmut; and Sturm, Elmar, to Ciba-Geigy Corporation. Process for the preparation of 1-triazolylethyl ether derivatives. 4,945,100, Cl. 514-383.000.
Oberste-Beulmann, Klaus; and Schupphaus, Herbert, to Gebr. Eickoff Maschinenfabrik u. Eisengiesserie mbH. Drum cutter-loader for underground mining. 4,944,558, Cl. 299-42.000.
Occelli, Mario L.; and Kennedy, James V., to Chevron Research Company. Process for cracking high metals content feedstocks. 4,944,865, Cl. 208-121.000.
Ochi, Daisuke; Yoshida, Yasuhiro; and Iwaki, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Alternator for motor vehicles. 4,945,272, Cl. 310-91.000.
Oda, Goro; Nagata, Niro; Nakatomi, Yoshitsugu; Sawafuji, Takashi; Shinozaki, Yoshihisa; and Goto, Eizo, to Kabushiki Kaisha Toshiba. Apparatus for manufacturing thermal print head. 4,944,786, Cl. 65-154.000.
Oddsen, Robert R.; and Ger, Ralph, to Innovative Surgical Devices, Inc. Surgical suturing instrument and method. 4,944,443, Cl. 227-19.000.
Oddsen, Robert R.: *See—*
Gwathmey, Owen M.; Sloane, Thomas E., Jr.; and Oddsen, Robert R., 4,944,295, Cl. 227-176.000.
OddzOn Products, Inc: *See—*
Silverglate, David E., 4,944,707, Cl. 446-48.000.
Odom, Edwin M.: *See—*
Vohland, Marion G.; Odom, Edwin M.; and Harris, Herbert H., Jr., 4,944,671, Cl. 432-8.000.
Oehrle, John B.: *See—*
Biddle, Ernest L., Jr.; Laessig, John D.; and Oehrle, John B., 4,945,490, Cl. 364-506.000.
Oerlikon Motch Corporation: *See—*
Carlier, Michel; and Blic, Olivier, 4,944,635, Cl. 406-10.000.
Carlier, Michel; and Bernard, Frederic, 4,944,636, Cl. 406-72.000.
Oertel, Gunter: *See—*
Kopp, Richard; Oertel, Gunter; Weigand, Eckehard; and Wiedermann, Rolf, 4,945,120, Cl. 521-163.000.
Ogawa, Atsushi; Suenaga, Hiroyoshi; and Minakawa, Kuninori, to NKK Corporation. Titanium base alloy for superplastic forming. 4,944,914, Cl. 420-418.000.
Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Method for formation of patterns using high energy beam. 4,945,028, Cl. 430-296.000.
Ogawa, Yasuhisa: *See—*
Nakamura, Takashi; and Ogawa, Yasuhisa, 4,945,375, Cl. 354-322.000.
Ogawa, Yonekichi, to Suisaku Kabushiki Kaisha. Filtering device. 4,944,871, Cl. 210-169.000.
Ogawa, Yukio: *See—*
Date, Nobuaki; Sunouchi, Akio; Saito, Syuichiro; Murata, Yoshitaka; Ogawa, Yukio; and Tezuka, Nobuo, 4,945,379, Cl. 354-441.000.
Ogawara, Hisashi: *See—*
Michizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, 4,944,881, Cl. 210-640.000.
Oglesby, Michael L.; and Cornelison, Kenneth E., to Alcatel NA, Inc. Fiber optic cable having an extended elongation window. 4,944,570, Cl. 350-96.230.
Ogo, Kazutaka: *See—*
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Teramoto, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, 4,945,487, Cl. 364-474.020.
Oguchi, Yoshihiro; and Santoh, Tsuyoshi, to Canon Kabushiki Kaisha. Optical recording medium. 4,944,981, Cl. 428-64.000.
Oguchi, Yuzo; Komatsu, Fumito; and Iizawa, Motohiro, to Kabushiki Kaisha Sankyo Seiko Seisakusho. Magnetic head mechanism for reversing head orientation and moving head in tape width direction. 4,945,437, Cl. 360-106.000.
Ogura, Tomoyuki: *See—*
Makabe, Takahiro; Ogura, Tomoyuki; Kawamura, Yasuo; Numata, Tatsuo; Hirata, Kiminori; Kudo, Masaki; Miyake, Toshiro; and Haruyama, Hiroshi, 4,945,091, Cl. 514-252.000.
Ohashi, Toshiyuki: *See—*
Shii, Kazuo; Ohashi, Toshiyuki; and Kobayashi, Hiroyuki, 4,945,237, Cl. 250-311.000.
Ohashi, Yasuo: *See—*
Ohta, Kenji; and Ohashi, Yasuo, 4,944,375, Cl. 192-8.00R.
Ohba, Shinya: *See—*
Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, 4,945,506, Cl. 364-736.000.
Ohberg, Ingemar, to Rockwool Aktiebolaget. Method and apparatus for vaccum cleaning a pile of mineral wool plates. 4,944,809, Cl. 134-21.000.
Ohgihara, Takahiro: *See—*
Murakami, Yoshikazu; Ohgihara, Takahiro; Niikura, Kanako; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,945,324, Cl. 333-202.000.
Ohkubo, Satoru: *See—*
Iwata, Toshio; and Ohkubo, Satoru, 4,944,271, Cl. 123-435.000.
Ohmori, Kenji: *See—*
Ishikawa, Takashi; Oshimura, Nobumitsu; and Ohmori, Kenji, 4,944,801, Cl. 75-349.000.
Ohmori, Naoto: *See—*
Hasegawa, Hirofumi; Kojima, Hiroaki; Matsuura, Yasuhiro; Ohmori, Naoto; and Yamada, Yukio, 4,945,390, Cl. 355-321.000.
Ohno, Shigeru: *See—*
Deguchi, Naoyasu; and Ohno, Shigeru, 4,945,033, Cl. 430-522.000.

Ohno, Toshinobu: *See*—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.
Ohouchi, Mituo: *See*—
Tanabe, Takeshi; Ide, Kenzi; and Ohouchi, Mituo, 4,945,216, Cl. 235-462.000.
Ohta, Kenji; and Ohashi, Yasuo, to Jidosha Denki Kogyo Kabushiki Kaisha. Reduction gearing device for a windshield wiper motor including a unidirectional brake. 4,944,375, Cl. 192-8.00R.
Ohta, Yoshinori, to Olympus Optical Co., Ltd. Static induction transistor and manufacturing method of the same. 4,945,392, Cl. 357-22.000.
Ohtsuka, Norio: *See*—
Fukami, Harukazu; Hashimoto, Masaki; Niwata, Shinjiro; Ohtsuka, Norio; and Fujita, Fumio, 4,945,104, Cl. 514-425.000.
Ohya, Hideshi; Miyatani, Takao; Kawamura, Keiji; and Kawabata, Yasutomo, to Toyota Jidosha Kabushiki Kaisha. Compound rotary encoder for detecting the rotation angle and the number of rotatioes of a rotor shaft. 4,945,231, Cl. 250-231.140.
Ohya, Kazuyuki; and Kimbara, Hidenori, to Mitsubishi Gas Chemical Company, Inc. Disc brake pad. 4,944,373, Cl. 188-251.00A.
Ohyama, Shinji: *See*—
Ibamoto, Masahiko; Shimada, Satoshi; Ohyama, Shinji; Sato, Manabu; Kuzunuki, Soshiro; and Kano, Mitsunari, 4,945,348, Cl. 340-784.000.
Oikawa, Ryuetsu; and Ikari, Akira, to Yazaki Corporation. Grommet. 4,945,193, Cl. 174-153.00G.
OJI Paper Co., Ltd.: *See*—
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, 4,944,988, Cl. 428-195.000.
Oka, Masataka: *See*—
Yamada, Hideaki; Kimura, Masato; Oka, Masataka; and Saito, Kohta, 4,944,427, Cl. 220-406.000.
Oka, Tetsuo: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Matsuzaki, Kunio; Ishii, Masami; Yabuno, Ryohei; and Oka, Tetsuo, 4,944,183, Cl. 73-295.000.
Okamoto, Hiroshi; and Fujioka, Souichirou, to Matsushita Electric Industrial Co., Ltd. Helical scan tracking system. 4,945,426, Cl. 360-70.000.
Okamoto, Kikuhiko: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.
Okamoto, Kyoichi, to Mitsubishi Denki Kabushiki Kaisha. Moisture drain structure for a dynamoelectric machine and manufacturing method therefor. 4,945,270, Cl. 310-88.000.
Okamoto, Yukikazu; Tagami, Manabu; Shinjo, Goro; and Tsuji, Kozo, to Sumitomo Chemical Company, Limited. Insecticidal wettable powder. 4,945,088, Cl. 514-132.000.
Okamura, Kouichi: *See*—
Ikeuchi, Masayuki; and Okamura, Kouichi, 4,945,232, Cl. 250-231.140.
Okamura, Mitsuyoshi: *See*—
Maeda, Ken-ichi; Saito, Mitsuo; Aikawa, Takeshi; Matoba, Tsukasa; and Okamura, Mitsuyoshi, 4,945,510, Cl. 364-900.000.
Okamura, Noboru: *See*—
Kubo, Kiyoshi; Okamura, Noboru; and Morikura, Susumu, 4,945,403, Cl. 358-13.000.
Okazaki, Masaki: *See*—
Momoki, Yasuhito; Hioki, Takanori; and Okazaki, Masaki, 4,945,038, Cl. 430-576.000.
Okazaki, Toshio: *See*—
Ono, Mamoru; Kudo, Ichiro; and Okazaki, Toshio, 4,944,475, Cl. 248-71.000.
Okii, Mitsuyoshi; and Ishijima, Shunichi, to Kyowa Hakko Kogyo Co., Ltd. Method of proliferating vesicular-arbuscular mycorrhizal fungi. 4,945,059, Cl. 435-254.000.
Okino, Yoshinori; Noguchi, Naoyuki; Kita, Tatsuya; and Shigemura, Takuro, to Mazda Motor Corp. Control apparatus for a vehicle engine equipped with an automatic transmission. 4,944,199, Cl. 74-858.000.
Oklahoma Medical Research Foundation: *See*—
Tang, Jordan J. N.; and Wang, Chi-Sun, 4,944,944, Cl. 424-94.600.
Okubo, Yukio: *See*—
Ueda, Seitaro; Okubo, Yukio; Izumi, Shinichiro; and Hoshiro, Takeshi, 4,944,715, Cl. 474-245.000.
Okuda, Hiroshi: *See*—
Inoue, Yasuo; Kikkawa, Masanari; Kamba, Masaru; and Okuda, Hiroshi, 4,944,178, Cl. 73-19.100.
Okui, Susumu: *See*—
Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, 4,944,504, Cl. 271-171.000.
Okumura, Mitsunao, to Murata Manufacturing Co., Ltd. Noise filter. 4,945,322, Cl. 333-184.000.
Okumura, Sueyoshi: *See*—
Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Ishimura, Toshihiko; and Katayori, Sinji, 4,945,370, Cl. 354-173.110.
Okuno, Masami: *See*—
Nakatsuka, Iwao; and Okuno, Masami, 4,945,162, Cl. 546-20.000.
Oldham, Thomas W.: *See*—
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,944,774, Cl. 51-309.000.
Oleson, John C.; Teske, Steven K.; Iturzaeta, Richard F.; and Langer, Erwin E., to Alpha Therapeutic Corporation. Bottle cutting and emptying machine. 4,944,647, Cl. 414-412.000.
Oliana, Pierluigi. Temporary support structure, particularly for emergency keys. 4,944,171, Cl. 70-456.00R.
Olney, John W., to G. D. Searle & Co. Aryl-cycloalkyl-alkanolamines for treatment of neurotoxic injury. 4,945,097, Cl. 514-318.000.
Olsen, Don B.: *See*—
Bramm, Gunter W.; and Olsen, Don B., 4,944,748, Cl. 623-3.000.
Olsen, Frederick O.: *See*—
Riedel, John E.; and Olsen, Frederick O., 4,944,040, Cl. 2-15.000.
Olson, Donald O. Ground stake for retaining irrigation conduit. 4,944,476, Cl. 248-87.000.
Olson, Jeffrey A., to Outboard Marine Corporation. Cylinder entrapment system with an air spring. 4,944,277, Cl. 123-532.000.
Olson, Leonard T.: *See*—
Brown, Michael B.; Ebert, William S.; Olson, Leonard T.; and Sloma, Richard R., 4,945,399, Cl. 357-74.000.
Olympus Optical Co., Ltd.: *See*—
Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwasa, Kazuyuki; and Nakano, Toshifumi, 4,945,372, Cl. 354-199.000.
Hisamichi, Yasushi; and Miyazaki, Akihiko, 4,945,366, Cl. 354-62.000.
Ichikawa, Hajime, 4,944,581, Cl. 350-641.000.
Nakamura, Kazunari, 4,945,409, Cl. 358-88.000.
Ohta, Yoshinori, 4,945,392, Cl. 357-22.000.
Omni Quest Corporation: *See*—
Chagnon, Mark S.; and Ferris, John R., 4,944,802, Cl. 106-20.000.
Onisawa, Kenichi: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.
Onkyo Kabushiki Kaisha: *See*—
Koga, Yoshiro; Kume, Hiroshi; and Nakao, Kenji, 4,945,301, Cl. 323-902.000.
Ono, Mamoru; Kudo, Ichiro; and Okazaki, Toshio, to Yazaki Corporation. Electric wire bundler. 4,944,475, Cl. 248-71.000.
Ono, Yoshimasa: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.
Ono, Yuzo; Yamanaka, Yutaka; and Kimura, Yasuo, to NEC Corporation. Optical head comprising a diffraction grating for directing two or more diffracted beams to optical detectors. 4,945,529, Cl. 369-109.000.
Oono, Tetsuya: *See*—
Wazaki, Yoshio; and Oono, Tetsuya, 4,944,358, Cl. 180-197.000.
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuaki, to Seiko Instruments, Inc. Memory writing apparatus. 4,945,515, Cl. 365-174.000.
Opitz, Reinhard: *See*—
Hosemann, Kurt; and Opitz, Reinhard, 4,944,813, Cl. 148-260.000.
Oppelt, Ralph; and Vester, Markus, to Siemens Aktiengesellschaft. $\pi/2$ power divider. 4,945,321, Cl. 333-119.000.
Opticord, Inc.: *See*—
Sandell, Patrick B.; and Ditzig, Albert, 4,945,530, Cl. 369-291.000.
O'Quin, Vorney. Portable stove. 4,944,284, Cl. 126-41.00R.
Orbach, Max A. Bottle support apparatus. 4,944,415, Cl. 211-75.000.
Orion Machinery Co., Ltd.: *See*—
Takeuchi, Toru; and Matsuzawa, Minoru, 4,944,249, Cl. 119-14.440.
Orlando, Franklin P.; Butler, Lee D.; Luttrell, Donald A.; and Goulart, Joseph S., to FMC Corporation. Height control system. 4,944,141, Cl. 56-17.100.
Osaka Municipal Government: *See*—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.
Osawa, Nobuyki, to Nippon Seiko Kabushiki Kaisha. Roller-type linear guide. 4,944,608, Cl. 384-58.000.
Osborn, John: *See*—
Huser, Marc; and Osborn, John, 4,945,174, Cl. 556-16.000.
Oscar Mayer Foods Corporation: *See*—
Cornish, Darrell G.; Mally, Timothy G.; Thiemann, Daniel A.; and Thompson, Bjorn J., 4,944,603, Cl. 383-5.000.
Grindrod, Paul E.; and Hustad, Gerald O., 4,944,134, Cl. 53-432.000.
Osher, John D.; Katzman, Allison W.; Luecke, Mark; and Wildman, John R., to Cap Toys, Inc. Toy ball. 4,944,363, Cl. 273-58.00A.
Oshima, Kazuo: *See*—
Nishikawa, Tomohisa; and Oshima, Kazuo, 4,944,821, Cl. 156-161.000.
Oshimura, Nobumitsu: *See*—
Ishikawa, Takashi; Oshimura, Nobumitsu; and Ohmori, Kenji, 4,944,801, Cl. 75-349.000.
Oslapas, Algis, to Ford Motor Company. Steering system position detector. 4,944,356, Cl. 180-79.100.
Osman, Akhtar; and Bradford, William G., to Polysar Limited. Method to treat rhodium-containing solutions. 4,944,926, Cl. 423-22.000.
Osterwise, George A., to Joy Technologies Inc. Miner cutting bit holding apparatus. 4,944,560, Cl. 299-91.000.

Ostman, Sven-Olov, to ABB Stal AB. PFBC power plant. 4,944,150, Cl. 60-39.182.
Osuga, ouichiro: *See*—
Yagishita, Aisaburo; Iriyama, Yasunori; and Osuga, ouichiro, 4,944,870, Cl. 210-103.000.
O'Sullivan, Anthony: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kitano, Noritoshi; Nishida, Akira; Frei, Bruno; and O'Sullivan, Anthony, 4,945,105, Cl. 514-450.000.
Ota, Yuichi: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.
Otis Engineering Corporation: *See*—
Mashaw, Howard R., Jr., 4,944,345, Cl. 166-206.000.
Ototani, Tohei, to Metal Research Corporation. Method of manufacturing clean steel. 4,944,798, Cl. 420-85.000.
Otsuka, Shoichi: *See*—
Kurakake, Mitsuo; Otsuka, Shoichi; and Muraoka, Yutaka, 4,945,496, Cl. 364-518.000.
Ott, Gunter: *See*—
Schon, Georg; Ott, Gunter; and Geist, Michael, 4,944,855, Cl. 204-181.700.
Otzen, Karl G.: *See*—
Rajendran, Narayanan; and Otzen, Karl G., 4,944,782, Cl. 55-444.000.
Ouchi, Teruo: *See*—
Takahashi, Nagashige; and Ouchi, Teruo, 4,944,287, Cl. 128-4.000.
Outboard Marine Corporation: *See*—
Anderson, Philip A., 4,945,338, Cl. 340-459.000.
Olson, Jeffrey A., 4,944,277, Cl. 123-532.000.
Owens-Illinois Glass Container Inc.: *See*—
Juvinall, John W.; and Ringlien, James A., 4,945,228, Cl. 250-223.00B.
Owens, John C., to Storage Technology Corporation. Tape having a surface with a low coefficient of friction and long wear characteristics. 4,944,995, Cl. 428-294.000.
Oya, Keiji: *See*—
Akutsu, Mitsuo; Iwakura, Syuji; and Oya, Keiji, 4,944,980, Cl. 428-64.000.
Oyama, Kiyotaka: *See*—
Kurauchi, Yasuhiro; Akazawa, Michihiro; Harada, Tsuneo; Oyama, Kiyotaka; and Tokuda, Akira, 4,944,852, Cl. 204-131.000.
Ozaki, Katsuya: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.
Ozaki, Kazuhisa; and Miura, Masakatsu, to Aisin-Warner Kabushiki Kaisha. Brake band drum for planetary gear-type transmissions. 4,944,376, Cl. 192-17.00A.
Ozaki, Nozomu: *See*—
Miida, Takashi; and Ozaki, Nozomu, 4,945,377, Cl. 354-402.000.
Ozaki, Yoshio: *See*—
Tanaka, Toshiaki; Nishikawa, Morihisa; Ozaki, Yoshio; Akamatsu, Kooji; Nakata, Masahiro; and Taneda, Atsushi, 4,945,199, Cl. 219-69.130.
Ozari, Yehuda: *See*—
Mallya, Prakash; Ozari, Yehuda; and Smith, Colin C., 4,944,888, Cl. 210-787.000.
Ozawa, Kazunori; and Araseki, Takashi, to NEC Corporation. Low bit-rate pattern encoding and decoding with a reduced number of excitation pulses. 4,945,565, Cl. 381-38.000.
Ozawa, Kazunori, to NEC Corporation. Method and apparatus for speech-band signal coding. 4,945,567, Cl. 381-49.000.
Packman, Elias W., to Norman Oksman. Method and composition for topically treating anorectal or other dermal wounds. 4,945,084, Cl. 514-53.000.
Page, David R.: *See*—
Clark, Carl E.; Ganek, Alan G.; Mall, Michael G.; and Page, David R., 4,945,480, Cl. 364-200.000.
Paker, Stephen J.: *See*—
Ackerson, Bruce D.; Paker, Stephen J.; and Wahlquist, Clayton C., 4,945,292, Cl. 315-387.000.
Pallhorn, Sebald, to Goldbach GmbH, Holz-, Kunststoff- und Metallverarbeitung. Floor tile. 4,944,130, Cl. 52-802.000.
Palmer, Donald E. Asymmetric audio cable for high fidelity signals. 4,945,189, Cl. 174-32.000.
Palmour, John W.; and Edmond, John A., to North Carolina State University. Bipolar junction transistor on silicon carbide. 4,945,394, Cl. 357-34.000.
Paloma Kogyo Kabushiki Kaisha: *See*—
Tsuchiya, Mitsuo; Matsubara, Masafumi; Mori, Yoshihiro; and Itami, Hideo, 4,944,283, Cl. 126-41.00R.
Pandey, Ramendra N.: *See*—
Wist, Abund O.; Pandey, Ramendra N.; and Fatouros, Panos P., 4,945,239, Cl. 250-358.100.
Papa, Anthony J.; and Bryant, David R., to Union Carbide Chemicals and Plastics Company Inc. Process for producing mixtures of ketones and aldehydes. 4,945,185, Cl. 568-387.000.
Pappis, James: *See*—
Willingham, Charles B.; and Pappis, James, 4,944,900, Cl. 264-1.200.
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Kang, Myong-Ku; Park, Byong-Hyun; and Jang, Won-Hee, 4,945,066, Cl. 437-30.000.
Parker, Eric C.: *See*—
Hardy, Donald P., Jr.; and Parker, Eric C., 4,944,523, Cl. 280-689.000.
Parker, Robert M.: *See*—
Gebhard, Albert W.; Knoedler, Roy E.; Parker, Robert M.; and Au, William G., 4,944,117, Cl. 49-55.000.
Parr, Willard J. Trailer assembly. 4,944,648, Cl. 414-483.000.
Parsons, Stephen A.; Dyer, Henry B.; and Dodsworth, John. Abrasive and wear resistant material. 4,944,913, Cl. 419-13.000.
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Chen, Nai Y.; Ketkar, Anil B.; and Partridge, Randall D., 4,944,862, Cl. 208-49.000.
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Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., 4,944,574, Cl. 350-245.000.
Pastrone, John; Fellingham, George H.; and Lawless, Michael, to Abbott Laboratories. Ultrasonic detector. 4,944,191, Cl. 73-599.000.
Patel, Arvind M., to International Business Machines Corporation. Method and apparatus for processing sample values in a coded signal processing channel. 4,945,538, Cl. 371-43.000.
Patrick, William J.: *See*—
Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.
Patrucco, Sergio, to 501 Patrucco Due Co. S.R.L., S.N. Process for the multiplication of plant varieties and products obtained thereby. 4,944,115, Cl. 47-7.000.
Patzelt, Helmut: *See*—
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,944,964, Cl. 427-203.000.
Pavlista, Alexander D.: *See*—
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Pavy, Dominique: *See*—
Moisan, Monique; Pavy, Dominique; Davoust, Marie-Eve; Saada, Serge; and Chollet, Patrick, 4,944,244, Cl. 118-723.000.
Pawloski, Chester E.; Fielding, Donna J.; and Wampfler, David J., to Dow Chemical Company, The. (Haloneocarbyl-substituted)(aliphatic or oxyaliphatic)(halogenated aliphatic or oxyaliphatic)-phosphorates with polyurethanes. 4,945,118, Cl. 521-107.000.
Payne, Doris P.: *See*—
Payne, George E.; and Payne, Doris P., 4,944,548, Cl. 296-97.800.
Payne, George E.; and Payne, Doris P. Side window shade for automobiles. 4,944,548, Cl. 296-97.800.
Payne, Steven J.: *See*—
Bagshaw, John M.; Kent, Lionel W. J.; Willats, Terence F.; and Payne, Steven J., 4,945,539, Cl. 372-13.000.
Payton, Mark A.: *See*—
Hardy, Kimber; van de Pol, Hendrick; Grindley, June; and Payton, Mark A., 4,945,052, Cl. 435-172.300.
PB Diagnostic Systems, Inc.: *See*—
Bowen, Mark S.; Fantone, Stephen D.; and Miller, Bruce E., 4,945,250, Cl. 250-461.100.
Pearson, Dale J.: *See*—
Cronin, John E.; Cronin, Susan F.; Kaanta, Carter W.; Koburger, Charles W., III; Luce, Stephen E.; and Pearson, Dale J., 4,944,682, Cl. 437-192.000.
Pedersen, Lee A.; and Stiles, Alvin B., to Aluminum Company of America. Catalyst of nickel and molybdenum supported on alumina. 4,945,079, Cl. 502-314.000.
Peerlkamp, Erik R., to Stamicarbon B.V. Molded nylon 4.6 article having first and second enthalpy. 4,945,152, Cl. 528-335.000.
Peery, John R.; Gold, Michael N.; Schorr, Saadia M.; and Gorby, Jack. Mattress assembly for the prevention and treatment of decubitus ulcers. 4,944,060, Cl. 5-453.000.
Peitz, Wolfgang: *See*—
Bunse, Wolfgang; Ernst, Hans-Otto; Droste, Heinz; Kalze, Franz-Josef; and Peitz, Wolfgang, 4,945,454, Cl. 362-61.000.
Pendleton, Robert J. Fence structure. 4,944,494, Cl. 256-68.000.
Pennington, Donald W.; and Allison, Joseph L., to Dow Chemical Company, The. Oxidation of halogenated polymers and anticaking halogenated polymers. 4,945,133, Cl. 525-261.000.
Pennwalt Corporation: *See*—
Sandler, Stanley R., 4,944,853, Cl. 204-157.760.
Pennzoil Products Company: *See*—
DesLauriers, Paul J.; and Heilman, William J., 4,945,017, Cl. 524-111.000.
Penz, Perry A.; Gately, Michael T.; and Katz, Alan J., to Texas Instruments Incorporated. Neural network and system. 4,945,494, Cl. 364-513.000.
Pepera, Gerald S.: *See*—
Bremenour, Edwin L.; Tratar, Michael F.; and Pepera, Gerald S., 4,945,448, Cl. 361-383.000.
Pereira, Silvania F.: *See*—
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Pernod Ricard: *See*—
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Pernpeintner, Alfons, to Siemens Aktiengesellschaft. Angular pulse generator with flux return. 4,945,274, Cl. 310-256.000.
Perr, Julius P., to Cummins Engine Company, Inc. Fuel injector train with variable injection rate. 4,944,275, Cl. 123-501.000.
Perret, Michel: *See*—
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, 4,945,197, Cl. 200-148.00A.

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Perrin, Danika: *See*—
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Perry, Gary L.: *See*—
Hella, Terry A.; and Perry, Gary L., 4,944,098, Cl. 34-156.000.

Perry, John C. Motion and orientation responsive device for seismic, intrusion, and tilt alarms and the like. 4,945,347, Cl. 340-689.000.

Perry, Kathleen A.: *See*—
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Perry, Richard R.: *See*—
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Pertron Controls Corporation: *See*—
Ito, Roy A.; and Kuo, Wen-Tar, 4,945,201, Cl. 219-110.000.

Perzan, Denis A.: *See*—
Sabatella, Robert J.; Mrowka, Joseph J.; McCuin, Jon P.; Robarge, Dean A.; Perzan, Denis A.; Markowski, Robert G.; and Reid, David A., 4,945,450, Cl. 361-334.000.

Perzan, Wayne A.: *See*—
Holtey, Thomas O.; Murray, Thomas L., Jr.; Smith, Scott W.; and Perzan, Wayne A., 4,945,473, Cl. 364-200.000.

Peschmann, Kristian R.; and Shen, Steve S., to Imatron, Inc. Composite electron beam target for use in X-ray imaging system and method of making same. 4,944,448, Cl. 228-173.200.

Petersen, Erling: *See*—
Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling, 4,945,090, Cl. 514-232.800.

Petersen, Robert J.; and Lemmerman, Marvin C. Light-weight slot-wall display panel. 4,944,416, Cl. 211-87.000.

Peterson, Aaron C.: *See*—
DeKarske, Clarence W.; and Peterson, Aaron C., 4,945,512, Cl. 365-49.000.

Peterson, James R.: *See*—
Jenekhe, Samson A.; and Peterson, James R., 4,945,156, Cl. 528-485.000.

Petlakh, Yakov M.: *See*—
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Petrachkoff, Peter, to PRMG, Inc. Furnace charger apparatus. 4,944,383, Cl. 198-468.600.

Petreleo Brasileiro S.A. - Petrobras: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

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Petrov, Peter S.: *See*—
Lyakov, Nedyalko K.; Haralampiev, Georgi A.; Nikolov, Todor G.; Buyukliev, Georgi S.; Petrov, Peter S.; Valchev, Peter V.; Myuftiev, Valcho P.; and Primov, Kalin T., 4,944,869, Cl. 209-173.000.

Peveto, Johnnie E., to Acustar, Inc. Quick change tool holder. 4,944,629, Cl. 403-330.000.

Pfeiffer, Hans C.: *See*—
Davis, Donald E.; Ho, Cecil T.; Lieberman, Jon E.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,945,246, Cl. 250-492.200.

Pfizer Hospital Products Group: *See*—
Kenna, Robert V., 4,944,756, Cl. 623-20.000.

Pfizer Hospital Products Group, Inc.: *See*—
Kenna, Robert V., 4,944,760, Cl. 623-20.000.

Pham, Hung V.: *See*—
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Philip Morris Incorporated: *See*—
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Phillips, John L.; and Ball, Robert P., to U.S. Philips Corporation. Microchannel plates formed with deposition using non-reactive gas. 4,945,286, Cl. 313-105.0CM.

Phillips, Joseph R.: *See*—
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Phillips Petroleum Company: *See*—
Lee, Fu Ming, 4,944,849, Cl. 203-55.000.

Piasecki, Douglas S., to Harris Corporation. Voltage limiter apparatus with inherent level shifting employing MOSFETs. 4,945,262, Cl. 307-451.000.

Picard, Gary A.; and Rao, Hayagriva V., to Grumman Aerospace Corporation. Monolithic gaAs high speed switch driver. 4,945,258, Cl. 307-270.000.

Piccinini, Renato: *See*—
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Piejko, Karl-Erwin: *See*—
Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Merten, Josef, 4,945,124, Cl. 525-63.000.

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Piltz, Lars-Erik, to AB Akerlund & Rausing. Closure device for a packaging container. 4,944,426, Cl. 220-270.000.

Pinchbeck, Colin; and Shorey, Thomas H., to Boeing Company, The. Wheel assembly including a solid tire. 4,944,563, Cl. 301-63.0DS.

Pinhas, Hanna: *See*—
Landa, Benzion; Ezuz, Shabtai; Shmaiser, Aron; Pinhas, Hanna; and Lior, Ishaiau, 4,945,387, Cl. 355-271.000.

Pinkerton Generator Inc.: *See*—
Pinkerton, Joseph F., 4,945,273, Cl. 310-208.000.

Pinkerton, Joseph F., to Pinkerton Generator Inc. High efficiency electrical machine. 4,945,273, Cl. 310-208.000.

Pioneer Electronic Corporation: *See*—
Igata, Toyonori, 4,945,524, Cl. 369-44.110.
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, 4,945,335, Cl. 340-426.000.

Piotrowski, Andrzej M.; and Band, Elliot I., to Akzo America Inc. Polymerization catalyst system. 4,945,076, Cl. 502-117.000.

Piper, James A., to Metalaser PTY. Cold electrode metal vapor laser. 4,945,545, Cl. 372-87.000.

Pipkins, Alfred R. Pirn marker sheet and method for forming the same. 4,944,978, Cl. 428-43.000.

Pipp Mobile Systems, Inc.: *See*—
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Pitney Bowes Inc.: *See*—
Gough, Rex M. K., 4,944,131, Cl. 53-117.000.
Gough, Rex M. K., 4,944,136, Cl. 53-493.000.
Lilly, Norman R.; Marin, M. James; and Field, Michael E., 4,944,827, Cl. 156-384.000.

Pittway Corporation: *See*—
Brill, Henry L., 4,945,340, Cl. 340-547.000.

Platzer, Kurt; Hirschek, Herwig; Schaller, Edwin; and Holzinger, Helmut, to Autefa Maschinenfabrik GmbH. Card webber. 4,944,502, Cl. 270-31.000.

Pliskin, William A.: *See*—
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Plucinski, Andrzej J., to Becton, Dickinson and Company. Organizer and dispenser for blood sample needle holders. 4,944,730, Cl. 604-187.000.

Plummer, Walter A., III, to Zippertubing Co., The. Semi-rigid plastic jacket with interlocking longitudinal seam. 4,944,976, Cl. 428-36.900.

Pohto, Arnold O.: *See*—
Mansoor, Dhafer Y.; and Pohto, Arnold O., 4,944,540, Cl. 293-115.000.

Poisel, Hans; and Trommer, Gerd, to Messerschmitt-Bolkow-Blohm GMBH. Optical-fiber gyroscope of sagnac type having a fiber-optic loop and 3×3 coupler. 4,944,590, Cl. 356-350.000.

Pola Chemical Industries Inc., Japan: *See*—
Suzuki, Toshimitsu; Sakaguchi, Masakazu; Miyata, Yoshiyuki; and Mori, Tomoyuki, 4,945,102, Cl. 514-398.000.

Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., to General Electric Company. Aromatic polyester-siloxane block copolymers and method for making. 4,945,147, Cl. 528-26.000.

Policastro, Peter P.: *See*—
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Pollard, Albert C. Multiple-part travelers' check providing enhanced security and prevention of unauthorized use. 4,944,532, Cl. 283-70.000.

Pollard, Brendon T.: *See*—
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Pollow, Kunhard: *See*—
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Polysar Limited: *See*—
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Poole, James E.; and Hartman, Marvis E., to PPG Industries, Inc. UV coatings containing chlorinated polyolefins, method of curing, and coated substrates therefrom. 4,945,003, Cl. 428-462.000.

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Porter, Leslie H.: *See*—
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Porter, Mildred. Vegetable washing attachment for water faucets. 4,944,051, Cl. 4-638.000.

Porubcan, Randolph S.: *See*—
Brokken, Kyle; and Porubcan, Randolph S., 4,945,110, Cl. 514-517.000.

Potini, A. Chimpirama, to Colgate-Palmolive Company. Antiperspirant and deodorant. 4,944,938, Cl. 424-68.000.

Powell, Anthony D., to MDT Corporation. Low tempersture sterilizer. 4,944,919, Cl. 422-26.000.

Powers, Robert W.: *See*—
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PPG Industries, Inc.: *See*—
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Poole, James E.; and Hartman, Marvis E., 4,945,003, Cl. 428-462.000.

Pribish, James R.: *See—*
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Priem, Curtis: *See—*
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PRMG, Inc.: *See—*
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Process Automation Business, Inc.: *See—*
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Procter & Gamble Company, The: *See—*
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McCall, Patrick C., 4,944,937, Cl. 424-65.000.
Van Oostein, Elco T. J. M.; and Leebeek, Antonius C. G., 4,944,400, Cl. 206-509.000.
Proctor, Ross; and Ruiz, Emilio. Circuit breaker signal. 4,945,345, Cl. 340-638.000.
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Prometrix Corporation: *See—*
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Prugnolle, Bernard: *See—*
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Pryor, Charles L.: *See—*
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Pryor, Dewey L.; and Pryor, Charles L., to D. L. Pryor & Sons, Inc. Pneumatically operated scaffolding. 4,944,366, Cl. 182-141.000.
Puerner, Dean A., to AMP Incorporated. Latch arm for electrical connector housing. 4,944,693, Cl. 439-358.000.
Pugach, Joseph; and Salek, Jeffrey S., to Aristech Chemical Corporation. Preparation of unsaturated ketones. 4,945,184, Cl. 568-313.000.
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Rue, Charles V.; Pukaite, Leonard G.; and Subramanian, Krishnamoorthy, 4,944,773, Cl. 51-307.000.
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R.G.B. S.p.A.: *See—*
Brusasco, Enzo, 4,944,555, Cl. 297-330.000.
Raasch, Hans, to W. Schlafhorst & Co. Apparatus for cross-winding a traveling yarn. 4,944,463, Cl. 242-18.0DD.
Raddatz, Erich: *See—*
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Radel, Winfried. Time indicator for a clock or watch. 4,945,522, Cl. 368-77.000.
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Rajendran, Narayanan; and Otzen, Karl G., to S. C. Johnson & Son, Inc. Baffle type hood and duct filters for commerical use. 4,944,782, Cl. 55-444.000.
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Rao, V. N. Mallikarjuna: *See—*
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Ratkoff, Georges; and Debeuvels, Jean-Paul. Portable apparatus for localized heating of the skin for therapeutic purposes. 4,944,297, Cl. 128-399.000.
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Rausing, Hans, to Tetra Pak Holdings & Finance S.A. Opening arrangement for cardboard package. 4,944,408, Cl. 206-628.000.
Rawcliffe, John. Physiotherapy apparatus. 4,944,288, Cl. 128-25.00R.
Ray, Charles D., to Surgical Dynamics, Inc. Bone impactors. 4,944,744, Cl. 606-79.000.
Ray, Roderick J.; and Newbold, David D., to Bend Research, Inc. Hybrid membrane separation systems. 4,944,882, Cl. 210-640.000.
Raychem Corporation: *See—*
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Raykovitz, Gary; Schmidt, Robert; and Puletti, Paul, to National Starch and Investment Holding Corporation. Toughened rubber based hot melt adhesive compositions for disposable applications. 4,944,993, Cl. 428-290.000.
Raytheon Company: *See—*
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Rayudu, S. Rao, to Buckman Laboratories International, Inc. Ester of carbamic acid useful as a microbicide and a preservative. 4,945,109, Cl. 514-478.000.
RCA Licensing Corporation: *See—*
Gurley, Thomas D.; and Sendelweck, Gene K., 4,945,414, Cl. 358-168.000.
Read, Shannon R., to Baroid Technology, Inc. Threaded pipe joint having improved seal ring entrapment. 4,944,538, Cl. 285-334.000.
Reaktor-Brennelement Union GmbH: *See—*
Schlomm, Hartmut; and Martin, Konrad, 4,944,912, Cl. 376-420.000.
Reber, Eric J., to Barber-Colman Company. Oxygen sensing probe having improved sensor tip and tip-supporting tube. 4,944,861, Cl. 204-428.000.
Redkey, Robert H. Golf practice club. 4,944,517, Cl. 273-186.00A.
Reel/Frame 5189/0412 Agfa-Gevaert Aktiengesellschaft: *See—*
Thiele, Harmut; Gruber, Leo; and Toral, Jose , 4,944,407, Cl. 206-628.000.
Regh, Karen A.: *See—*
Rich, Jonathan D.; McDermott, Philip J.; Davis, Gary C.; Policastro, Peter P.; Regh, Karen A.; Hernandez, Pamela K.; and Guggenheim, Thomas L., 4,945,148, Cl. 528-26.000.
Reid, David A.: *See—*
Sabatella, Robert J.; Mrowka, Joseph J.; McCuin, Jon P.; Robarge, Dean A.; Perzan, Denis A.; Markowski, Robert G.; and Reid, David A., 4,945,450, Cl. 361-334.000.
Reif, Robert S.: *See—*
Allen, John H.; and Reif, Robert S., 4,944,679, Cl. 434-2.000.
Reil Rock Products, Inc.: *See—*
Armstrong, Larry, 4,944,124, Cl. 52-169.120.
Reinforced Earth Company, The: *See—*
Keiser, Bernhard E., 4,945,362, Cl. 343-841.000.
Reismann, Hans-Jurgen: *See—*
Svagr, Alexandr; Bogendorfer, Hans; Riebschlager, Klaus; Reismann, Hans-Jurgen; and Wenig, Hubertus, 4,944,175, Cl. 72-225.000.
Reiss, John R.: *See—*
Balukin, Richard F.; Reiss, John R.; and Jerina, Frank J., 4,944,564, Cl. 303-33.000.
Reiss, Kurt: *See—*
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, 4,945,004, Cl. 428-469.000.
Reiter, John P. Hand sander with automatic slack take-up feature. 4,944,128, Cl. 51-363.000.
Reiter, Rainer: *See—*
Goerlich, Dieter; Kolodzie, Rainer; and Reiter, Rainer, 4,944,153, Cl. 60-303.000.
Relhor S.A.: *See—*
Jolidon, Francois; and Richard, Willy, 4,944,170, Cl. 70-267.000.
Remy, David C.: *See—*
Baldwin, John J.; Remy, David C.; and Claremon, David A., 4,945,182, Cl. 564-349.000.
Renard, Paul A.: *See—*
Sionnet, Jean; and Renard, Paul A., 4,944,559, Cl. 299-86.000.

Renner, James S., to MK-Ferguson Company. Welding or burning shield. 4,944,444, Cl. 228-59.000.
Rensselaer Polytechnic Institute: *See*—
Lu, Toh-Ming; and Mei, Shao-Ning, 4,944,961, Cl. 427-38.000.
Rentzea, Costin; Rademacher, Wilhelm; Jung, Johann; and Harreus, Albrecht, to BASF Aktiengesellschaft. Azetidine derivative and their use for regulating plant growth. 4,944,789, Cl. 71-88.000.
Research Development Corporation: *See*—
Hamaya, Toru; and Horikoshi, Koki, 4,945,049, Cl. 435-168.000.
Research Development Corporation of Japan: *See*—
Yamashita, Takaji; and Uchida, Hiroshi, 4,945,241, Cl. 250-367.000.
Yanagawa, Motoo, 4,944,778, Cl. 55-131.000.
Research Foundation of State University of NY, The: *See*—
Schroeder, Roger A.; Broyden, Robert H.; Dearstyne, Robert C.; Magner, Joseph L.; Gephart, Randall J.; Dayton, David W.; and Newman, Raymond A., 4,944,056, Cl. 5-81.00R.
Restle, Serge: *See*—
Maignan, Jean; Restle, Serge; and Lang, Gerard, 4,945,093, Cl. 514-235.800.
Reuther, Wolfgang: *See*—
Baus, Ulf; Reuther, Wolfgang; and Fikentscher, Rolf, 4,945,166, Cl. 548-369.000.
Baus, Ulf; Reuther, Wolfgang; and Hahn, Erwin, 4,945,167, Cl. 548-375.000.
Revlon, Inc.: *See*—
Futter, Menachem; Wilson, James E.; and Golden, Annette M., 4,944,625, Cl. 401-153.000.
Hoffman, Robert W., 4,945,363, Cl. 343-895.000.
Reynolds, Joseph D.: *See*—
Stine, Alan C.; and Reynolds, Joseph D., 4,944,197, Cl. 74-477.000.
Rezende, Joel: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz L.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.
Rhodes, Arthur B. Conveyor system. 4,944,228, Cl. 104-172.300.
Rhone Poulenc Chimie: *See*—
Huser, Marc; and Osborn, John, 4,945,174, Cl. 556-16.000.
Ricci, Donato L. Ratchet feed drive for clamshell lathe. 4,944,205, Cl. 82-113.000.
Rich, Jonathan D.; McDermott, Philip J.; Davis, Gary C.; Policastro, Peter P.; Regh, Karen A.; Hernandez, Pamela K.; and Guggenheim, Thomas L., to General Electric Company. Silicon-polycarbonate block copolymers. 4,945,148, Cl. 528-26.000.
Rich, Jonathan D.: *See*—
Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
Richard, Bennett M.; and Johnson, Michael H., to Baker Hughes Incorporated. Method and apparatus for direct high velocity preparation of completion/workover systems. 4,944,347, Cl. 166-278.000.
Richard, Willy: *See*—
Jolidon, Francois; and Richard, Willy, 4,944,170, Cl. 70-267.000.
Richard Wolf GmbH: *See*—
Falk, Ernst, 4,944,093, Cl. 30-251.000.
Richardson, Ronald D., to Caterpillar Inc. Engine ignition system with an insulated and extendable extender. 4,944,259, Cl. 123-169.0PA.
Richter, Ole J.: *See*—
Jacobsen, Finn; and Richter, Ole J., 4,944,167, Cl. 68-181.00R.
Ricoh Company, Ltd.: *See*—
Ishino, Tokio; Sato, Atsushi; and Demura, Motokuni, 4,945,368, Cl. 354-149.110.
Kaneuchi, Kunihiro; Kawamoto, Toshiki; and Nakatani, Tomofumi, 4,945,557, Cl. 379-67.000.
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,945,022, Cl. 430-120.000.
Usui, Noriyuki; and Satoh, Tsumori, 4,945,389, Cl. 355-296.000.
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Riebschlager, Klaus: *See*—
Svagr, Alexandr; Bogendorfer, Hans; Riebschlager, Klaus; Reismann, Hans-Jurgen; and Wenig, Hubertus, 4,944,175, Cl. 72-225.000.
Riedel, John E.; and Olsen, Frederick O., to Minnesota Mining and Manufacturing Company. Light occlusive eye patch. 4,944,040, Cl. 2-15.000.
Rightmyre, Bruce M., to Du Pont de Nemours, E. I., and Company. Automated transparency organizer. 4,944,586, Cl. 353-108.000.
Rigotti, James M.: *See*—
Boigenzahn, Jeffrey F.; Bratvold, Darrell E.; Rigotti, James M.; and Tufty, Lyle R., 4,945,435, Cl. 360-106.000.
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Akiike, Shigeru; and Rikukawa, Yuuji, 4,944,158, Cl. 62-81.000.
Riley, David S.: *See*—
Turner, Gregory P.; and Riley, David S., 4,945,030, Cl. 430-331.000.
Riley, Terry M., to FMC Corporation. Multi-directional vibratory conveyor. 4,944,381, Cl. 198-370.000.
Rinaldi, Anthony W.: *See*—
Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., 4,944,754, Cl. 623-16.000.
Ring, Thomas J.: *See*—
Bosser, Clayton E., 4,944,054, Cl. 5-61.000.
Ringlien, James A.: *See*—
Juvinall, John W.; and Ringlien, James A., 4,945,228, Cl. 250-223.00B.
Rinno, Helmut: *See*—
Kapmeyer, Wolfgang; and Rinno, Helmut, 4,945,146, Cl. 526-304.000.
Rioux, Robert A., Jr. Telephone hanger for hospital bed. 4,945,561, Cl. 379-454.000.
Riseman, Jacob: *See*—
Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.
Rishel, James B., to Systecon, Inc. Monitor and control for a multi-pump system. 4,945,491, Cl. 364-510.000.
Ritchie, Allan: *See*—
Clemow, Alastair J. T.; Jaeger, Scott H.; and Ritchie, Allan, 4,944,742, Cl. 606-59.000.
Rivin, Eugeny I., to Board of Governors of Wayne State University, The. Conjugate gear system. 4,944,196, Cl. 74-443.000.
Robarge, Dean A.: *See*—
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Robb, Frank B., to Jos. Dyson & Sons, Inc. Boat support means. 4,944,633, Cl. 405-3.000.
Robbins, David J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government for the. Method and apparatus for monitoring surface layer growth. 4,945,254, Cl. 250-571.000.
Robert Bosch GmbH: *See*—
Babitzka, Rudolf, 4,944,486, Cl. 251-129.210.
Baressel, Detlef; and Scharner, Peter, 4,944,273, Cl. 123-440.000.
Gneisa, Heinz; Kienzle, Wolfgang; Sauer, Rudolf; and Wuensch, Werner, 4,944,182, Cl. 73-204.260.
Nitschke, Werner; Weiler, Hugo; and Drobny, Wolfgang, 4,945,486, Cl. 364-431.110.
Wilde, Werner, 4,944,268, Cl. 123-342.000.
Roberts, Larry K.: *See*—
Garland, R. Darryl, 4,944,624, Cl. 401-131.000.
Robertshaw Controls Company: *See*—
McIntosh, Harold A., 4,944,083, Cl. 29-622.000.
Robertson, Edward I., to E. D. R. Industries, Inc. Method of assembling earring and display card assembly and assembly thereby formed. 4,944,389, Cl. 206-6.100.
Robertson, G. Neil, II; and Allen, Truman F. Device and process for hygienic mouth to mouth artificial respiration. 4,944,291, Cl. 128-203.110.
Robin, Philippe: *See*—
Aigrain, Pierre; Mourey, Bruno; Dubois, Jean C.; Hareng, Michel; and Robin, Philippe, 4,944,575, Cl. 350-333.000.
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Robinson, John W.: *See*—
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Roblin, William J.: *See*—
Gifford, Eric P.; and Roblin, William J., 4,944,825, Cl. 156-294.000.
Robolase Systems, Inc.: *See*—
Vahab, Christian, 4,945,489, Cl. 364-505.000.
Robson, Peter M. Profiled fasteners. 4,944,072, Cl. 24-587.000.
Rochester Telephone Corporation: *See*—
Teumer, Christopher R.; and Mendes, Mark A., 4,945,555, Cl. 379-21.000.
Rock-Way, Inc.: *See*—
Hardy, Harold, Jr., 4,944,551, Cl. 296-100.000.
Rockwell International Corporation: *See*—
McMichael, Ian C., 4,944,591, Cl. 356-350.000.
Rockwell, Richard T.: *See*—
Manzer, Leo E.; Rao, V. N. Mallikarjuna; Rockwell, Richard T.; Sisk, Michael A.; Warwas, Edwin J.; and Winteringham, Roy, 4,944,846, Cl. 203-1.000.
Rockwool Aktiebolaget: *See*—
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Rodriguez, Facundo T.: *See*—
Aguiar, Ocasio F.; Rodriguez, Facundo T.; and Fuentes, Raul, 4,944,282, Cl. 126-25.00R.
Rodriguez, Michael A. Surgical laser backstop instrument. 4,944,738, Cl. 606-2.000.
Rodriguez, Richard, to Shell Oil Company. System and method for detection of malfunctioning steam traps. 4,945,343, Cl. 340-606.000.
Rogall, Wolfgang: *See*—
Zodrow, Rudolf; Rogall, Wolfgang; Hoveler, Egon; and Buchholz, Rainer, 4,944,830, Cl. 156-567.000.
Rogers, Alan J., to National Research Development Corporation. Optical fibers. 4,944,571, Cl. 350-96.290.
Rogers Corporation: *See*—
Bronnenberg, David L., 4,945,029, Cl. 430-316.000.
Landi, Vincent R., 4,944,087, Cl. 29-848.000.
Rohde, Ralph: *See*—
Huth, Andreas; Rahtz, Dieter; Rohde, Ralph; Schmiechen, Ralph; and Seidelmann, Dieter, 4,945,163, Cl. 546-85.000.
Rohm Co., Ltd.: *See*—
Kurita, Yoshio; Takami, Katsuhiro; Tanaka, Kenji; and Kosumi, Yuji, 4,945,398, Cl. 357-74.000.

Tanaka, Haruo; Mushiage, Masato; and Ishida, Yuhji, 4,944,246, Cl. 118-729.000.
Tanaka, Haruo; and Nakata, Naotaroh, 4,945,544, Cl. 372-70.000.
Rosazani, Artemio. Heating system. 4,944,453, Cl. 237-8.00R.
Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., to Combined Optical Industries Limited. Stand magnifier and lens. 4,944,574, Cl. 350-245.000.
Rorer Pharmaceutical Corporation: *See*—
Tuttle, Kenneth A.; and Corrado, James, 4,944,829, Cl. 156-497.000.
Rosby Corporation: *See*—
Yurgevich, Howard J., 4,944,421, Cl. 220-1.500.
Rosemount Inc.: *See*—
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Rosenberg, Larry: *See*—
Rowan, Larry; and Rosenberg, Larry, 4,944,211, Cl. 89-8.000.
Rosenberg, Robert D.: *See*—
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Rosenblad, Axel E., to Rosenblad Corporation. Interstage liquor heater for plate type falling film evaporators. 4,944,839, Cl. 159-13.100.
Rosenblad Corporation: *See*—
Rosenblad, Axel E., 4,944,839, Cl. 159-13.100.
Roskam, Willem: *See*—
Legoux, Richard; Leplatois, Pascal; Joseph, Evelyne L.; Niaudet, Brigitte; and Roskam, Willem, 4,945,047, Cl. 435-69.400.
Ross, Mark S., to Mobil Oil Corporation. Packing removal tool. 4,944,081, Cl. 29-235.000.
Rotal Industries & Trading Ltd.: *See*—
Tal, Amir, 4,945,357, Cl. 341-20.000.
Roth, Cary A.: *See*—
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,944,774, Cl. 51-309.000.
Rowan, Larry; and Rosenberg, Larry. Mass action driver device. 4,944,211, Cl. 89-8.000.
Rowley, Gerald: *See*—
Litman, David; Zuk, Robert; and Rowley, Gerald, 4,945,205, Cl. 219-121.720.
Rubasch, Anthony P.: *See*—
Kinney, John W.; Rubasch, Anthony P.; and Degenhart, Thomas W., 4,945,328, Cl. 335-202.000.
Rubinstein, Alan I., to University of Southern California. Novel method to treat blood. 4,944,920, Cl. 422-37.000.
RUD-Kettenfabrik Rieger: *See*—
Dalferth, Hans, 4,944,388, Cl. 198-731.000.
Rud, Stanley E., Jr.: *See*—
Frick, Roger L.; and Rud, Stanley E., Jr., 4,944,187, Cl. 73-718.000.
Rudolph, Hans: *See*—
Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, 4,945,137, Cl. 525-375.000.
Rue, Charles V.; Pukaite, Leonard G.; and Subramanian, Krishnamoorthy, to Norton Company. Bonded abrasive tools with combination of finely microcrystalline aluminous abrasive and a superabrasive. 4,944,773, Cl. 51-307.000.
Ruebsamen, Klaus: *See*—
Eschenfelder, Volker; Schmied, Bernhard; and Ruebsamen, Klaus, 4,944,943, Cl. 424-94.640.
Ruff, Gerd: *See*—
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Ruggirello, Donald A.; and Banfield, Christopher R., to Schering Corporation. Gas chromatograph/autosampler coupling assembly. 4,944,781, Cl. 55-386.000.
Ruiz, Emilio: *See*—
Proctor, Ross; and Ruiz, Emilio, 4,945,345, Cl. 340-638.000.
Rule, Mark: *See*—
Fagerburg, David R.; Rule, Mark; Watkins, Joseph J.; and Lawrence, Paul B., 4,945,155, Cl. 528-480.000.
Rulf, Donald C.: *See*—
Tou, James C.; and Rulf, Donald C., 4,944,180, Cl. 73-38.000.
Runge, Richard O.: *See*—
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Ruschau, Walter: *See*—
Nebelung, Hermann H.; and Ruschau, Walter, 4,944,207, Cl. 83-162.000.
Russell, Donald H. Rescue balloon. 4,944,242, Cl. 116-210.000.
Russo, Ronald D., to Sandoz Nutrition Corporation. Gastrostomy feeding port. 4,944,732, Cl. 604-247.000.
Rusterholz, John T.; Homan, Charles J.; Brown, Lowell E.; Bennett, Donald B.; Malnati, Robert J.; and Hamstra, James R., to Unisys Corporation. Tightly coupled scientific processing system. 4,945,479, Cl. 364-200.000.
Ryham, Rolf: *See*—
Henricson, Kaj; Ryham, Rolf; and Sannholm, Krister, 4,944,840, Cl. 162-46.000.
Ryobi Ltd.: *See*—
Ishii, Koji; and Ikeda, Naoki, 4,944,223, Cl. 101-148.000.
Rzechula, Michael J., to Slick Ice Limited. Spreader attachment apparatus. 4,944,103, Cl. 37-219.000.
Rzomp, J. Richard: *See*—
Johns, Robert H.; and Rzomp, J. Richard, 4,944,495, Cl. 266-100.000.
S. C. Johnson & Son, Inc.: *See*—
Rajendran, Narayanan; and Otzen, Karl G., 4,944,782, Cl. 55-444.000.
S.T.E.P.: *See*—
Jouillat, Claude, 4,944,432, Cl. 222-321.000.
Saada, Serge: *See*—
Moisan, Monique; Pavy, Dominique; Davoust, Marie-Eve; Saada, Serge; and Chollet, Patrick, 4,944,244, Cl. 118-723.000.
Saaski, Elric W.; and Hartl, James C., to Metricor, Inc. Optical measuring device using a spectral modulation sensor having an optically resonant structure. 4,945,230, Cl. 250-227.210.
Sabatella, Robert J.; Mrowka, Joseph J.; McCuin, Jon P.; Robarge, Dean A.; Perzan, Denis A.; Markowski, Robert G.; and Reid, David A., to General Electric Company. Modular electric switch-circuit breaker assembly. 4,945,450, Cl. 361-334.000.
Saen, Haruo: *See*—
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Saengsuraiporn, Chamna: *See*—
Schroeder, George L.; Couch, Francis O.; and Saengsuraiporn, Chamna, 4,945,533, Cl. 370-32.100.
Safari, Ahmad: *See*—
Sagong, Geon; Newnham, Robert E.; Safari, Ahmad; and Jang, Sei-Joo, 4,944,891, Cl. 252-62.900.
Safe Medical Devices, Inc.: *See*—
Carrell, Michael W.; and Gericke, Stephen H., 4,944,728, Cl. 604-164.000.
Sagong, Geon; Newnham, Robert E.; Safari, Ahmad; and Jang, Sei-Joo, to Hoechst Celanese Corp. Easily poled 0-3 piezoelectric composites for transducer applications. 4,944,891, Cl. 252-62.900.
Sailer, Hanns P.: *See*—
DeBiasi, Mark S.; Danek, Robert J.; Sailer, Hanns P.; Goldman, Ira B.; and Lesslie, David J., 4,945,443, Cl. 361-93.000.
Saint-Gobain Recherche: *See*—
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Saito, Hiroyuki: *See*—
Nagaoka, Shinji; Seki, Yoichi; Saito, Hiroyuki; and Taniwaki, Michio, 4,945,378, Cl. 354-429.000.
Saito, Kohta: *See*—
Yamada, Hideaki; Kimura, Masato; Oka, Masataka; and Saito, Kohta, 4,944,427, Cl. 220-406.000.
Saito, Mitsuo: *See*—
Maeda, Ken-ichi; Saito, Mitsuo; Aikawa, Takeshi; Matoba, Tsukasa; and Okamura, Mitsuyoshi, 4,945,510, Cl. 364-900.000.
Saito, Syuichiro: *See*—
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Saitou, Mitsuo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion and method for manufacture thereof. 4,945,037, Cl. 430-567.000.
Sakaguchi, Katsuyoshi: *See*—
Katayama, Hideaki; Hasegawa, Akira; and Sakaguchi, Katsuyoshi, 4,944,951, Cl. 425-58.100.
Sakaguchi, Masakazu: *See*—
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Sakai, Minoru; Takahashi, Osamu; and Aoki, Kozo, to Fuji Photo Film Co., Ltd. Image-forming process comprising bleaching at low pH a material comprising a cyan coupler and hydroquinone. 4,945,031, Cl. 430-393.000.
Sakai, Toru: *See*—
Yoneshige, Yasuo; Misumi, Atsushi; Hiromoto, Shuji; and Sakai, Toru, 4,944,992, Cl. 428-198.000.
Sakai, Toshio; and Akao, Michitoshi, to Brother Kogyo Kabushiki Kaisha. Light irradiation control device for use in image recording apparatus. 4,945,222, Cl. 250-205.000.
Sakai, Yoshihito: *See*—
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Sakakibara, Kohei; Masuoka, Kanetaro; and Fukushima, Toshio, to Inax Corporation. Disk type valve. 4,944,330, Cl. 137-625.310.
Sakama, Mitsunori: *See*—
Fukuda, Takeshi; Amachi, Nobumitsu; Sakama, Mitsunori; Sakamoto, Naoya; and Yamazaki, Shunpei, 4,945,226, Cl. 250-214.00R.
Sakamoto, Naoya: *See*—
Fukuda, Takeshi; Amachi, Nobumitsu; Sakama, Mitsunori; Sakamoto, Naoya; and Yamazaki, Shunpei, 4,945,226, Cl. 250-214.00R.
Sakamoto, Nobuyuki: *See*—
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Sakamoto, Shuichi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,945,081, Cl. 514-30.000.
Sakamoto, Yukio; Zushi, Mamoru; and Bando, Masahiro, to Murata Manufacturing Co., Ltd. Noise suppression inductor. 4,945,332, Cl. 336-69.000.
Sakamura, Ken; and Kobayashi, Souichi, to Mitsubihsi Denki Kabushiki Kaisha. Data processor with I/O area detection. 4,945,472, Cl. 364-200.000.
Sakharova, Bronislava. Bait composition and insecticide. 4,944,950, Cl. 424-623.000.

Saksena, Sanjeev. Method for high energy defibrillation of ventricular fibrillation in humans without a thoracotomy. 4,944,300, Cl. 128-419.00D.

Sakuhara, Toshihiko: *See*—
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuaki, 4,945,515, Cl. 365-174.000.

Sakurai, Keita: *See*—
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.

Sakurai, Yoshihiro: *See*—
Huh, Phil-yool; and Sakurai, Yoshihiro, 4,944,046, Cl. 4-243.000.

SALC di Pellegrino & C.S.d.f.: *See*—
Santi, Claudio, 4,944,752, Cl. 623-15.000.

Salek, Jeffrey S.: *See*—
Pugach, Joseph; and Salek, Jeffrey S., 4,945,184, Cl. 568-313.000.

Salerno, Mark. Treadmill speed reset system. 4,944,713, Cl. 474-11.000.

Salgues, Pierre; and Verrecchia, Roger, to Commissariat a l'Energie Atomique. Ultra-rapid electronic camera. 4,945,416, Cl. 358-209.000.

Salim, Awa S. M. Synergistic biologically active substances. 4,945,094, Cl. 514-264.000.

Salter, Lowell S., Jr.; Simmons, Thomas E.; and Innis, Charles L., Jr., to Morgan Construction Company. Oil film bearing and brushing. 4,944,609, Cl. 384-118.000.

Sampson, Stephen: *See*—
Danbach, Philip J.; and Sampson, Stephen, 4,944,568, Cl. 350-96.200.

SamSung Electronics Co., Ltd.: *See*—
Kang, Myong-Ku; Park, Byong-Hyun; and Jang, Won-Hee, 4,945,066, Cl. 437-30.000.

Sanai, Yukiharu, to Mitsubishi Denki Kabushiki Kaisha. Liquid crystal display. 4,945,349, Cl. 340-784.000.

Sanchez, Ramiro: *See*—
Mehta, Vijay C.; Rathman, Terry L.; Sanchez, Ramiro; and Morrison, Robert C., 4,944,894, Cl. 252-182.120.

Sandell, Patrick B.; and Ditzig, Albert, to Opticord, Inc. Cartridge for optical data discs. 4,945,530, Cl. 369-291.000.

Sanden Corporation: *See*—
Akiike, Shigeru; and Rikukawa, Yuuji, 4,944,158, Cl. 62-81.000.

Sandler, Stanley R., to Pennwalt Corporation. Photochemical preparation of 3-(organothio) aldehydes. 4,944,853, Cl. 204-157.760.

Sandoz Nutrition Corporation: *See*—
Russo, Ronald D., 4,944,732, Cl. 604-247.000.

Sanford, John C.; Wolf, Edward D.; and Allen, Nelson K., to Cornell Research Foundation, Inc. Method for transporting substances into living cells and tissues and apparatus therefor. 4,945,050, Cl. 435-172.100.

Sanford, Norman R.: *See*—
Krause, William E.; and Sanford, Norman R., 4,945,550, Cl. 375-94.000.

Sankyo Company Limited: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kitano, Noritoshi; Nishida, Akira; Frei, Bruno; and O'Sullivan, Anthony, 4,945,105, Cl. 514-450.000.

Sannholm, Krister: *See*—
Henricson, Kaj; Ryham, Rolf; and Sannholm, Krister, 4,944,840, Cl. 162-46.000.

Santi, Claudio, to SALC di Pellegrino & C.S.d.f. Hair prosthesis method. 4,944,752, Cl. 623-15.000.

Santoh, Tsuyoshi: *See*—
Oguchi, Yoshihiro; and Santoh, Tsuyoshi, 4,944,981, Cl. 428-64.000.

Santos, James P.: *See*—
Gross, Clifford M.; and Santos, James P., 4,944,554, Cl. 297-284.000.

Santos, Luiz D.: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.

Sargent, Charles L.; and Antos, John M., to Thetford Corporation. Self-contained RV sanitary system. 4,944,048, Cl. 4-323.000.

Sartor, Mariano; and Tonel, Valerio, to Nordica S.P.A. Closure and adjustment device, particularly for ski boots. 4,944,100, Cl. 36-120.000.

Sartori, Guido: *See*—
Ho, S. Winston; Sartori, Guido; Thaler, Warren A.; and Dalrymple, David C., 4,944,880, Cl. 210-640.000.

Sasaoka, Hiroshi: *See*—
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazuhiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.

Sassenberg, Richard. Spray can nozzle protector. 4,944,458, Cl. 239-288.500.

Satake Engineering: *See*—
Satake, Toshihiko, 4,945,296, Cl. 318-538.000.

Satake, Toshihiko, to Satake Engineering. Variable speed controllable induction motor. 4,945,296, Cl. 318-538.000.

Satellite Technology Services, Inc.: *See*—
Horton, Edwin T.; and Smith, Edward W., 4,945,563, Cl. 380-5.000.

Sato, Akira: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.

Sato, Atsushi: *See*—
Ishino, Tokio; Sato, Atsushi; and Demura, Motokuni, 4,945,368, Cl. 354-149.110.

Sato, Kazuo; Yanai, Toshiaki; Kitano, Noritoshi; Nishida, Akira; Frei, Bruno; and O'Sullivan, Anthony, to Sankyo Company Limited. 13-Halomilbemycin derivatives, their preparation and compositions containing them. 4,945,105, Cl. 514-450.000.

Sato, Manabu: *See*—
Ibamoto, Masahiko; Shimada, Satoshi; Ohyama, Shinji; Sato, Manabu; Kuzunuki, Soshiro; and Kano, Mitsunari, 4,945,348, Cl. 340-784.000.

Sato, Osamu: *See*—
Kawasaki, Masahiro; and Sato, Osamu, 4,945,376, Cl. 354-400.000.

Sato, Shigemi, to Fostex Corporation of Japan. Sync crosstalk cancelling circuit. 4,945,439, Cl. 360-124.000.

Sato, Shinya: *See*—
Iwahashi, Yuji; Urayama, Kiyoshi; and Sato, Shinya, 4,945,440, Cl. 360-132.000.

Sato, Tatsuru: *See*—
Yui, Yasuji; Hitachi, Akio; Sato, Tatsuru; and Shirakura, Akira, 4,945,382, Cl. 355-27.000.

Sato, Tomokazu: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.

Sato, Toshifumi; and Ide, Motoki, to NEC Corporation. Power source control apparatus. 4,945,300, Cl. 323-318.000.

Sato, Tsunehiko: *See*—
Sugiyama, Tuyoshi; Takeda, Hideo; Sato, Tsunehiko; and Chikamasa, Hiroshi, 4,944,808, Cl. 134-15.000.

Sato, Tutomu; Yura, Haruhiko; Nasu, Yoshihiko; Fujiwara, Atsumi; and Mori, Shigeo, to Nippon Hoso Kyokai; and Kabushiki Kaisha Toshiba. Matching circuit. 4,945,317, Cl. 330-301.000.

Sato, Yoshio: *See*—
Michizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, 4,944,881, Cl. 210-640.000.

Satoh, Tsumori: *See*—
Usui, Noriyuki; and Satoh, Tsumori, 4,945,389, Cl. 355-296.000.

Satoh, Yuji: *See*—
Tanoue, Akifumi; Kono, Hiromi; and Satoh, Yuji, 4,944,194, Cl. 74-335.000.

Satsuka, Mamoru; and Furusawa, Hironobu, to Toyo Boseki Kabushiki Kaisha. Curled electrical conductor cord. 4,945,191, Cl. 174-69.000.

Sauer, Rudolf: *See*—
Gneiss, Heinz; Kienzle, Wolfgang; Sauer, Rudolf; and Wuensch, Werner, 4,944,182, Cl. 73-204.260.

Saunders, Susan R.: *See*—
Catanese, John A.; and Saunders, Susan R., 4,944,856, Cl. 204-129.200.

Sauter, Hubert: *See*—
Zipplies, Matthias; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, 4,945,112, Cl. 514-555.000.

Savitt, Scott: *See*—
Sogard, David J.; and Savitt, Scott, 4,944,745, Cl. 606-194.000.

Savory Equipment, Inc.: *See*—
Gogan, James M.; and Gialanella, Joseph, 4,945,212, Cl. 219-388.000.

Sawada, Kazuo: *See*—
Yamauchi, Kazuhisa; Sawada, Kazuo; and Nakai, Yoshihiro, 4,944,925, Cl. 422-249.000.

Sawada, Shigeru: *See*—
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,945,364, Cl. 346-160.000.

Sawafuji, Takashi: *See*—
Oda, Goro; Nagata, Niro; Nakatomi, Yoshitsugu; Sawafuji, Takashi; Shinozaki, Yoshihisa; and Goto, Eizo, 4,944,786, Cl. 65-154.000.

Sayles, David C., to United States of America, Army. Ultra-ultrahigh burning rate composite modified double-base propellants containing porous ammonium perchlorate. 4,944,816, Cl. 149-19.800.

Scaglia, Enzo. Method to convey roving packages with the roving prepositioned. 4,944,146, Cl. 57-281.000.

Scally, Henry A.; and Gingrich, Harold L., to Ametek Corporation. Flow meter. 4,944,190, Cl. 73-861.580.

Scantest Systems A/S: *See*—
Janum, Viggo K., 4,945,302, Cl. 324-73.100.

Scanu, Angelo M.: *See*—
Fless, Gunther M.; and Scanu, Angelo M., 4,945,040, Cl. 435-7.000.

Schafer, Helmut, to Desitin Arzneimittel GmbH. Process for the preparation of E-2-propyl-2-pentenoic acid and physiologically compatible salts thereof. 4,945,180, Cl. 562-599.000.

Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, to Bayer Aktiengesellschaft. Binder combinations and a process for the production of flat materials. 4,945,137, Cl. 525-375.000.

Schaible, Paul M.: *See*—
Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Pliskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.

Schaller, Edwin: *See*—
Platzer, Kurt; Hirschek, Herwig; Schaller, Edwin; and Holzinger, Helmut, 4,944,502, Cl. 270-31.000.

Schallner, Otto: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter, 4,945,165, Cl. 548-362.000.
Schara, Robert E.: *See*—
Bassa, Ivette A.; Destephano, Joseph P.; Katcher, Jay H.; and Schara, Robert E., 4,944,955, Cl. 426-579.000.
Scharf, Gunther: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, 4,945,004, Cl. 428-469.000.
Scharner, Peter: *See*—
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Scheiderer, Gerrit: *See*—
Fiedler, Kurt; Kratz, Bernhard; Kordel, Gerhard; and Scheiderer, Gerrit, 4,944,224, Cl. 102-202.200.
Scheinpflug, Hans: *See*—
Jager, Gerhard; Bockmann, Klaus; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,945,101, Cl. 514-383.000.
Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, 4,945,064, Cl. 436-503.000.
Huth, Andreas; Rahtz, Dieter; Rohde, Ralph; Schmiechen, Ralph; and Seidelmann, Dieter, 4,945,163, Cl. 546-85.000.
Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling, 4,945,090, Cl. 514-232.800.
Schering Corporation: *See*—
Bishop, Keith H.; and Blake, William S., 4,944,429, Cl. 222-153.000.
Ruggirello, Donald A.; and Banfield, Christopher R., 4,944,781, Cl. 55-386.000.
Schiel, Christian: *See*—
Flamig, Hans; Schutte, Andreas; Schiel, Christian; Steiner, Karl; and Mullner, Josef, 4,944,089, Cl. 29-895.220.
Schilling, Otto: *See*—
Balliello, Paolo; Schilling, Otto; and Bruttel, Beat, 4,944,768, Cl. 8-524.000.
Schilling, Peter, to Westvaco Corporation. Plaster of Paris (Stucco) as mixing aid for aqueous bituminous emulsion aggregate slurries. 4,944,804, Cl. 106-277.000.
Schirmer, Marna L.: *See*—
Katz, Seymour; and Schirmer, Marna L., 4,944,313, Cl. 128-853.000.
Schlaeger, Gary D., to Burlington Northern Railroad, a wholly owned subsidiary of Burlington Northern, Inc. Dual-purpose depressed center railway flat car. 4,944,232, Cl. 105-355.000.
Schlecker, Rainer: *See*—
Franke, Albrecht, deceased; Schlecker, Rainer; Gries, Josef; Von Philipsborn, Gerda; and Unger, Liliane, 4,945,114, Cl. 514-652.000.
Schlomm, Hartmut; and Martin, Konrad, to Reaktor-Brennelement Union GmbH. Fuel rod for a nuclear reactor fuel assembly. 4,944,912, Cl. 376-420.000.
Schlumberger Industries, S.A.: *See*—
Didiergeorge, Pierre, 4,945,213, Cl. 235-31.00T.
Schlumberger Technologies, Inc.: *See*—
Deering, Michael F., 4,945,500, Cl. 364-522.000.
Schlumberger Technology Corporation: *See*—
Airey, Peter, 4,944,350, Cl. 166-373.000.
Schmaderer, Gerhard: *See*—
Hilke, Rainer; and Schmaderer, Gerhard, 4,944,666, Cl. 425-131.100.
Schmerda, Richard F.; Dombeck, John A.; and Kaufman, Lance R., to Gentron Corporation. Current sense circuit. 4,945,445, Cl. 361-101.000.
Schmidt, Eric, to Wallace Computer Services, Inc. Oversize laser mailer and return envelope and method. 4,944,449, Cl. 229-73.000.
Schmidt, Eric, to Wallace Computer Services, Inc. Oversize laser mailer and method. 4,944,450, Cl. 229-73.000.
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Lacquer, and process for producing anti-corrosion coatings. 4,944,964, Cl. 427-203.000.
Schmidt, Linda S.: *See*—
Depiano, Joseph G.; and Schmidt, Linda S., 4,944,094, Cl. 33-371.000.
Schmidt, Robert: *See*—
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Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling, to Schering Aktiengesellschaft. Phenoxy-substituted beta-carboline derivatives, their production and their use as drugs. 4,945,090, Cl. 514-232.800.
Schmiechen, Ralph: *See*—
Huth, Andreas; Rahtz, Dieter; Rohde, Ralph; Schmiechen, Ralph; and Seidelmann, Dieter, 4,945,163, Cl. 546-85.000.
Schmied, Bernhard: *See*—
Eschenfelder, Volker; Schmied, Bernhard; and Ruebsamen, Klaus, 4,944,943, Cl. 424-94.640.
Schmiemann, John P. Audible circuit tracer. 4,945,346, Cl. 340-656.000.
Schneider, Gerhart: *See*—
Schroder, Ludwig; Stransky, Werner; Mengel, Rudolf; Raddatz, Erich; Lust, Sigmund; Linden, Gerbert; and Schneider, Gerhart, 4,944,791, Cl. 71-92.000.
Schneider, Herbert H.: *See*—
Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling, 4,945,090, Cl. 514-232.800.
Schneider, Pina: *See*—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 4,945,559, Cl. 379-399.000.
Schneider, Richard T.; and Hauck, Frederick A. Method for methane production. 4,944,771, Cl. 48-197.00R.
Schoendorfer, Donald W.; and Berthe, Claude E. Continuous centrifugation system and method for directly deriving intermediate density material from a suspension. 4,944,883, Cl. 210-782.000.
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Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,944,964, Cl. 427-203.000.
Schon, Georg; Ott, Gunter; and Geist, Michael, to BASF Lacke + Farben Aktiengesellschaft. Aqueous electrocoating baths for cathodic plant deposition and processes for their preparation. 4,944,855, Cl. 204-181.700.
Schoneman, Scott R.: *See*—
Wedertz, Larry D.; Vazquez, Jose R.; and Schoneman, Scott R., 4,944,226, Cl. 102-476.000.
Schorr, Saadia M.: *See*—
Peery, John R.; Gold, Michael N.; Schorr, Saadia M.; and Gorby, Jack, 4,944,060, Cl. 5-453.000.
Schroder, Ludwig; Stransky, Werner; Mengel, Rudolf; Raddatz, Erich; Lust, Sigmund; Linden, Gerbert; and Schneider, Gerhart, to Shell Internationale Research Maatschappij B.V. Herbicidal hydantoins. 4,944,791, Cl. 71-92.000.
Schroeder, George L.; Couch, Francis O.; and Saenguraiporn, Chamna, to Kentrox Industries, Inc. Method and apparatus for transmitting data. 4,945,533, Cl. 370-32.100.
Schroeder, Mel C.: *See*—
Kiely, John S.; Lesheski, Lawrence E.; and Schroeder, Mel C., 4,945,160, Cl. 540-481.000.
Schroeder, Roger A.; Broyden, Robert H.; Dearstyne, Robert C.; Magner, Joseph L.; Gephart, Randall J.; Dayton, David W.; and Newman, Raymond A., to Research Foundation of State University of NY, The. Method and apparatus for transporting a disabled person. 4,944,056, Cl. 5-81.00R.
Schuetz, James A., to Honeywell Inc. Resistive overlayer for magnetic films. 4,945,397, Cl. 357-71.000.
Schulle, Gaylon E. Adjustable base for needlework frame. 4,944,105, Cl. 38-102.000.
Schulte, Peter G. Connector protector. 4,944,685, Cl. 439-135.000.
Schultz, Wolfgang: *See*—
Heinrichs, Hartmut; Brumsack, Hans-Jurgen; Loftfield, Norman; and Konig, Nils, 4,944,923, Cl. 422-102.000.
Schulz-DuBois, Erich: *See*—
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Schulze, Paul E.: *See*—
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Schumacher, Richard W.: *See*—
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Schupphaus, Herbert: *See*—
Oberste-Beulmann, Klaus; and Schupphaus, Herbert, 4,944,558, Cl. 299-42.000.
Schutte, Andreas: *See*—
Flamig, Hans; Schutte, Andreas; Schiel, Christian; Steiner, Karl; and Mullner, Josef, 4,944,089, Cl. 29-895.220.
Schweickert, Hermann: *See*—
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Schwertlein, Frank-Lothar; and Lenz, Michael, to Siemens Aktiengesellschaft. Integratable circuit configuration for reverse current reduction in an inversely operated transistor. 4,945,444, Cl. 361-101.000.
Science Applications International Corporation: *See*—
Kamm, Lawrence J., 4,945,269, Cl. 310-15.000.
SciMed Life Systems, Inc.: *See*—
Sogard, David J.; and Savitt, Scott, 4,944,745, Cl. 606-194.000.
Scozzafava, Milton; and Clary, John G., to Addmaster Corporation. Printer device for duplicate slips and the like. 4,944,620, Cl. 400-608.100.
Seagate Technology, Inc.: *See*—
Smith, Robert F., 4,945,311, Cl. 328-167.000.
Sebald, Mark D.; and Neumeyer, Richard E., to Barber-Colman Company. Voltage follower with pull-apart conector. 4,945,316, Cl. 330-110.000.
Security Tag Systems, Inc.: *See*—
Hogan, Dennis L., 4,944,075, Cl. 24-704.100.
Seel, Klaus: *See*—
Gansen, Peter; Wolf, Klaus-Dieter; and Seel, Klaus, 4,945,117, Cl. 521-99.000.
Segawa, Masashi: *See*—
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 4,945,002, Cl. 428-425.600.

Seibert, Gerhard: *See*—
Grabley, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, 4,945,108, Cl. 514-475.000.
Seidelmann, Dieter: *See*—
Huth, Andreas; Rahtz, Dieter; Rohde, Ralph; Schmiechen, Ralph; and Seidelmann, Dieter, 4,945,163, Cl. 546-85.000.
Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling, 4,945,090, Cl. 514-232.800.
Seiko Epson Corporation: *See*—
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Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,945,364, Cl. 346-160.000.
Yamagata, Kiyohiro; Abe, Nobumasa; Toba, Koichi; Kobayashi, Atsushi; and Watanabe, Koji, 4,945,381, Cl. 355-27.000.
Seiko Instruments, Inc.: *See*—
Asari, Naosuke; and Sakamoto, Nobuyuki, 4,945,499, Cl. 364-521.000.
Ejiri, Akira, 4,945,352, Cl. 340-805.000.
Ooumi, Manabu; Sakuhara, Toshihiko; and Ataka, Tatsuaki, 4,945,515, Cl. 365-174.000.
Seikosha Co., Ltd.: *See*—
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Seki, Reiji: *See*—
Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Ishimura, Toshihiko; and Katayori, Sinji, 4,945,370, Cl. 354-173.110.
Seki, Yoichi: *See*—
Nagaoka, Shinji; Seki, Yoichi; Saito, Hiroyuki; and Taniwaki, Michio, 4,945,378, Cl. 354-429.000.
Sekitani, Yasushi: *See*—
Uchihori, Yuji; Sekitani, Yasushi; and Yoshida, Ikuo, 4,945,048, Cl. 435-105.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Fukuda, Takeshi; Amachi, Nobumitsu; Sakama, Mitsunori; Sakamoto, Naoya; and Yamazaki, Shunpei, 4,945,226, Cl. 250-214.00R.
Sendelweck, Gene K.: *See*—
Gurley, Thomas D.; and Sendelweck, Gene K., 4,945,414, Cl. 358-168.000.
Serad, George A.: *See*—
Felton, Clinton D.; Gibson, Baylor D.; Jamison, Charles E.; McWhorter, William O.; and Serad, George A., 4,944,854, Cl. 204-168.000.
Serizawa, Hiroyuki; and Mochizuki, Akio, to Koito Manufacturing Co., Ltd. Vehicular headlamp. 4,945,453, Cl. 362-61.000.
Serono Diagnostics Ltd.: *See*—
Forrest, Gordon C.; Rattle, Simon J.; Robinson, Grenville A.; and Hill, Hugh A. O., 4,945,045, Cl. 435-25.000.
Serre, Jean-Claude: *See*—
Coulier, Guy; and Serre, Jean-Claude, 4,945,007, Cl. 428-542.800.
Service Electricite de France National: *See*—
Benejean, Richard, 4,945,508, Cl. 364-802.000.
Service National Electricite de France: *See*—
Feron, Paul, 4,945,304, Cl. 324-107.000.
Seshamani, Venkatraman, to Foster Wheeler Energy Corporation. Cyclone separator including a hopper formed by water-steam cooled walls. 4,944,250. Cl. 122-20.00B.
Seto, Hirohito: *See*—
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Sevrin, Mireille: *See*—
George, Pascal; and Sevrin, Mireille, 4,945,096, Cl. 514-307.000.
Seymour, Raymound K.: *See*—
Doughty, Dennis J.; Seymour, Raymound K.; and Maulandi, Aymon A., 4,945,327, Cl. 335-201.000.
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Merval, Jean-Marc; and Perrin, Danika, 4,945,413, Cl. 358-158.000.
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Shishkin, Viktor V.; Kryazhevtskikh, Nikolai F.; and Shapovalov, Jury P., 4,944,353, Cl. 172-23.000.
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Cain, Alan, 4,944,702, Cl. 440-51.000.
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Sharp, Richard C., to Raytheon Company. Gain medium for radiant energy source. 4,945,543, Cl. 372-55.000.
Shaw, Karen. Patient support and lifting device. 4,944,057, Cl. 5-89.000.
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Sheer, M. Lana, to Du Pont de Nemours, E. I., and Company. Composite coil forms for electrical systems. 4,944,975, Cl. 428-36.100.
Shekleton, Jack R., to Sundstrand Corporation. Augmented turbine combustor cooling. 4,944,152, Cl. 60-39.360.
Shelby, Barry G. Endless belt moisture control apparatus. 4,944,385, Cl. 198-495.000.
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Kohli, Jeffrey T.; and Shelby, James E., 4,944,784, Cl. 65-32.300.
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Suzuki, Kenji; and Sheldon, Dunstan P., 4,944,619, Cl. 400-224.200.
Shell Internationale Research Maatschappij B.V.: *See*—
Schroder, Ludwig; Stransky, Werner; Mengel, Rudolf; Raddatz, Erich; Lust, Sigmund; Linden, Gerbert; and Schneider, Gerhart, 4,944,791, Cl. 71-92.000.
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Drent, Eit, 4,945,179, Cl. 560-233.000.
Rodriguez, Richard, 4,945,343, Cl. 340-606.000.
Udding, Anne C., 4,945,136, Cl. 525-351.000.
Shen, Ming T. Drawer slides sets. 4,944,605, Cl. 384-19.000.
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Peschmann, Kristian R.; and Shen, Steve S., 4,944,448, Cl. 228-173.200.
Sherman, William, III, to Brandt, Inc. Sheet length detector with skew compensation. 4,944,505, Cl. 271-265.000.
Sheu, Tyng-Jen. Writing implement. 4,944,622, Cl. 401-90.000.
Shibata, Kazuhiro: *See*—
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Shieh, Jiin-Tsong: *See*—
Wu, Jaw-Shyong; Wang, Yun-Terng; Wu, Hann-Chang; and Shieh, Jiin-Tsong, 4,944,106, Cl. 43-15.000.
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Suzuki, Yasuhiro; Yoshikawa, Tuguo; Shibata, Kazuhiro; Fukui, Akio; and Shiga, Kiyotaka, 4,944,640, Cl. 408-211.000.
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Okino, Yoshinori; Noguchi, Naoyuki; Kita, Tatsuya; and Shigemura, Takuro, 4,944,199, Cl. 74-858.000.
Shih, Cheng-Fong: *See*—
Elliott, Linda C.; Horn, Gary R.; Jordan, Lloyd E., II; Levine, Frank E.; Shih, Cheng-Fong; and Myre, William W., Jr., 4,945,474, Cl. 364-200.000.
Shii, Kazuo; Ohashi, Toshiyuki; and Kobayashi, Hiroyuki, to Hitachi, Ltd. Transmission electron microscope. 4,945,237, Cl. 250-311.000.
Shikata, Shitsuw: *See*—
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Shiley, Inc.: *See*—
Buckberg, Gerald D.; Maloney, James V., Jr.; Jones, Kenneth A.; and West, Weldon D., 4,944,729, Cl. 604-164.000.
Shimada, Satoshi: *See*—
Ibamoto, Masahiko; Shimada, Satoshi; Ohyama, Shinji; Sato, Manabu; Kuzunuki, Soshiro; and Kano, Mitsunari, 4,945,348, Cl. 340-784.000.
Shimada, Takahisa; Kajita, Hideo; Okumura, Sueyoshi; Seki, Reiji; Ishimura, Toshihiko; and Katayori, Sinji, to Minolta Camera Kabushiki Kaisha. Film rewinding system of camera. 4,945,370, Cl. 354-173.110.
Shimada, Yuki: *See*—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.
Shimadzu Corporation: *See*—
Makabe, Hideki; and Iwahashi, Kenji, 4,945,551, Cl. 378-34.000.
Shimoma, Taketoshi; Koshigoe, Shinpei; and Hasegawa, Takahiro, to Kabushiki Kaisha Toshiba. Electron gun for color-picture tube device. 4,945,284, Cl. 313-414.000.
Shin, Yun K.: *See*—
Frieses, G. Delbert; Shin, Yun K.; and Hoffman, Lewis, deceased, 4,945,071, Cl. 501-41.000.
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Shindo, Yoshio: *See*—
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Shinjo, Goro: *See*—
Okamoto, Yukikazu; Tagami, Manabu; Shinjo, Goro; and Tsuji, Kozo, 4,945,088, Cl. 514-132.000.
Shinonaga, Hirohiko: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 4,945,423, Cl. 358-300.000.
Shinozaki, Yoshihisa: *See*—
Oda, Goro; Nagata, Niro; Nakatomi, Yoshitsugu; Sawafuji, Takashi; Shinozaki, Yoshihisa; and Goto, Eizo, 4,944,786, Cl. 65-154.000.
Shirai, Hitoshi: *See*—
Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwasa, Kazuyuki; and Nakano, Toshifumi, 4,945,372, Cl. 354-199.000.
Shirakura, Akira: *See*—
Yui, Yasuji; Hitachi, Akio; Sato, Tatsuru; and Shirakura, Akira, 4,945,382, Cl. 355-27.000.
Shirato, Atsushi: *See*—
Takeno, Masahiro; Sakai, Yoshihito; and Shirato, Atsushi, 4,944,243, Cl. 118-305.000.
Shiratori, Yoshitaka: *See*—
Takahashi, Hiroyuki; and Shiratori, Yoshitaka, 4,944,121, Cl. 51-267.000.
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Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., to Trest "Juzhvodoprovod" . Agricultural machine. 4,944,353, Cl. 172-23.000.
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Landa, Benzion; Ezuz, Shabtai; Shmaiser, Aron; Pinhas, Hanna; and Lior, Ishaiau, 4,945,387, Cl. 355-271.000.
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Sholder, Jason A., to Siemens-Pacesetter, Inc. Atrial rate based programmable pacemaker with automatic mode switching means. 4,944,298, Cl. 128-419.0PG.
Shorey, Thomas H.: *See*—
Pinchbeck, Colin; and Shorey, Thomas H., 4,944,563, Cl. 301-63.0DS.
Shtark, Hanoh: *See*—
Weisman, Ilan; Shapira, Roni; Shafir, Roni; and Shtark, Hanoh, 4,944,120, Cl. 51-165.720.
Sibuet, Henri, to Commissariat a l'Energie Atomique. Process for obtaining a pattern, in ferromagnetic material having differently sloping sides. 4,944,831, Cl. 156-643.000.
Sidefact Limited: *See*—
Ipson, Stanley S., 4,945,281, Cl. 315-58.000.
Sidhu, Gursharan S.: *See*—
Bruffey, Bill M.; Sidhu, Gursharan S.; Dirks, Patrick W.; and McFall, Christopher R., 4,945,475, Cl. 364-2[illegible].000.
Siegel, Marvin I.: *See*—
Smith, Sidney R.; and Siegel, Marvin I., 4,945,095, Cl. 514-278.000.
Siemens Aktiengesellschaft: *See*—
Dangschat, Rainer, 4,945,463, Cl. 363-56.000.
Krause, Ruediger; and Foshag, Reinhard, 4,945,554, Cl. 379-10.000.
Oppelt, Ralph; and Vester, Markus, 4,945,321, Cl. 333-119.000.
Pernpeintner, Alfons, 4,945,274, Cl. 310-256.000.
Schwertlein, Frank-Lothar; and Lenz, Michael, 4,945,444, Cl. 361-101.000.
Siemens-Bendix Automotive Electronics L.P.: *See*—
Imoehl, William J., 4,944,269, Cl. 123-399.000.
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Sholder, Jason A., 4,944,298, Cl. 128-419.0PG.
Silvian, Sergiu, 4,944,299, Cl. 128-419.0PG.
Siemon Company, The: *See*—
Siemon, John A.; and Early, Richard, 4,944,698, Cl. 439-676.000.
Siemon, John A.; and Early, Richard, to Siemon Company, The. Dual modular jack adapter. 4,944,698, Cl. 439-676.000.
Siler-Khodr, Theresa M.: *See*—
Kuehl, Thomas J.; Harper, M. J. K.; Khodr, Gabriel S.; and Siler-Khodr, Theresa M., 4,945,055, Cl. 435-226.000.
Silverglate, David E., to OddzOn Products, Inc. Ring-like flying toy. 4,944,707, Cl. 446-48.000.
Silvestri, John L.: *See*—
Dybsky, John M.; Erswell, George A., Jr.; Silvestri, John L.; Loser, Karl H.; and McDonald, Craig A., 4,944,818, Cl. 156-71.000.
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Simme, Sture B. R. Stanchion for goods vehicles. 4,944,545, Cl. 296-43.000.
Simmons, Thomas E.: *See*—
Salter, Lowell S., Jr.; Simmons, Thomas E.; and Innis, Charles L., Jr., 4,944,609, Cl. 384-118.000.
Simms, John A.: *See*—
Bruylants, Paul P.; Corcoran, Patrick H.; and Simms, John A., 4,945,145, Cl. 526-279.000.
Simon, Hans. Electrical connecting clamp. 4,944,700, Cl. 439-801.000.
Simon, Marvin K.; and Divasalar, Dariush, to United States of America, National Aeronautics and Space Administration. Trellis coded modulation for transmission over fading mobile satellite channel. 4,945,549, Cl. 375-53.000.
Sims, Gregory A., to Extermination Systems, Inc. Integrated pest control system. 4,944,110, Cl. 43-124.000.
Singh, Raj N.; and Morrison, William A., to General Electric Company. Method of obtaining a fiber-containing composite. 4,944,904, Cl. 269-60.000.
Sink, Brian E.: *See*—
Lang, Gary D.; and Sink, Brian E., 4,944,162, Cl. 62-380.000.
Sionnet, Jean; and Renard, Paul A., to Societe Industrielle de Combustible Nucleaire. Tool for a mine working machine comprising a diamond-charged abrasive component. 4,944,559, Cl. 299-86.000.
Sireul, Jacques; and Gauthier, Rene , to General Electric CGR SA. Examination bed for NMR or tomodensitometry apparatus. 4,944,501, Cl. 269-322.000.
Sisk, Michael A.: *See*—
Manzer, Leo E.; Rao, V. N. Mallikarjuna; Rockwell, Richard T.; Sisk, Michael A.; Warwas, Edwin J.; and Winteriagham, Roy, 4,944,846, Cl. 203-1.000.
Sitnikov, Alexandr E.: *See*—
Gradoboev, Vladimir T.; Melnikov, Leonid I.; Klimenov, Alexandr M.; and Sitnikov, Alexandr E., 4,944,382, Cl. 198-399.000.
Sjoovist, Ingvar S.: *See*—
Lindgren, Mats E. G.; and Sjoovist, Ingvar S., 4,944,361, Cl. 181-129.000.
Sjostrom, Eero; and Raimo, Alen, to Kajaani Elektroniikka Oy. Procedure for controlling alkaline pulping processes. 4,944,841, Cl. 162-49.000.
SKF Nova AB: *See*—
Andersson, Borje, 4,944,642, Cl. 408-241.00R.
Skorka, Thomas: *See*—
Graf, Lothar; Maerte, Leo; and Skorka, Thomas, 4,944,430, Cl. 222-259.000.
Slick Ice Limited: *See*—
Rzechula, Michael J., 4,944,103, Cl. 37-219.000.
Slingshot Corporation: *See*—
Davis, Howard, 4,944,099, Cl. 36-97.000.
Sloane, Thomas E., Jr.: *See*—
Gwathmey, Owen M.; Sloane, Thomas E., Jr.; and Oddsen, Robert R., 4,944,295, Cl. 227-176.000.
Sloma, Richard R.: *See*—
Brown, Michael B.; Ebert, William S.; Olson, Leonard T.; and Sloma, Richard R., 4,945,399, Cl. 357-74.000.
Slusarski, Ronald S.: *See*—
Fayngersh, Zakhary; Slusarski, Ronald S.; and Schumacher, Richard W., 4,944,066, Cl. 16-49.000.
Sluyts, Domien: *See*—
Van Royen, Luc; Putseys, Roland; Van Herck, Willy; Sluyts, Domien; Pype, Robert; and Brandle, Karl, 4,944,929, Cl. 423-235.000.
Smedley, William H.: *See*—
Haber, Terry M.; Foster, Clark B.; and Smedley, William H., 4,944,723, Cl. 604-110.000.
Smith, B. Stewart. Disposable face shield. 4,944,312, Cl. 128-857.000.
Smith, C. Morris; and Walsh, Dennis E., to Mobil Oil Corp. Thermal hydrocracking of heavy stocks in the presence of solvents. 4,944,863, Cl. 208-107.000.
Smith, Colin C.: *See*—
Mallya, Prakash; Ozari, Yehuda; and Smith, Colin C., 4,944,888, Cl. 210-787.000.
Smith, David W.: *See*—
Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., 4,944,069, Cl. 17-49.000.
Smith, Donald W.: *See*—
Brock, James D.; Smith, Donald W.; and Bassett, James H., 4,944,630, Cl. 404-83.000.
Smith, Edward W.: *See*—
Horton, Edwin T.; and Smith, Edward W., 4,945,563, Cl. 380-5.000.
Smith International, Inc.: *See*—
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,944,774, Cl. 51-309.000.
Smith, Mary E. Fabric device in combination with a bed, resting surface or examining table for facilitating user turning and patient examinations. 4,944,053, Cl. 5-61.000.
Smith, Robert F., to Seagate Technology, Inc. Electronically variable equalizer. 4,945,311, Cl. 328-167.000.
Smith, Scott W.: *See*—
Holtey, Thomas O.; Murray, Thomas L., Jr.; Smith, Scott W.; and Perzan, Wayne A., 4,945,473, Cl. 364-200.000.
Smith, Sidney R.; and Siegel, Marvin I. Method for suppressing the immune response. 4,945,095, Cl. 514-278.000.
Smith, Stuart T.: *See*—
Lindsey, Kevin; and Smith, Stuart T., 4,944,606, Cl. 384-42.000.
Smith, Willis H., Jr.: *See*—
Lacker, Anna M.; Margerum, J. David; Ramos, Elena; Smith, Willis H., Jr.; and Lim, Khoon C., 4,944,576, Cl. 350-334.000.
Smithers, Ian J.: *See*—
Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., 4,944,574, Cl. 350-245.000.
Smits, Guide F.; and Grunbauer, Henri J. M., to Dow Chemical Company, The. Foaming system for rigid urethane and isocyanurate foams. 4,945,119, Cl. 521-131.000.

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Svagr, Alexandr; Bogendorfer, Hans; Riebschlager, Klaus; Reismann, Hans-Jurgen; and Wenig, Hubertus, 4,944,175, Cl. 72-225.000.

Snelgrove, R. Vernon: *See—*
McCullough, Francis P., Jr.; Snelgrove, R. Vernon; Brewster, Steven L.; and Higgins, George C., 4,944,999, Cl. 428-371.000.

Snider, John M. Weightlifting backpack. 4,944,509, Cl. 272-119.000.

Snow, Karis W., to Nalco Chemical Company. Method for inhibiting epichlorohydrin fouling. 4,944,847, Cl. 203-8.000.

Snygg, Keijo K., to A. Ahlstrom Corporation. Method and apparatus for decelerating a jumbo roll of a paper or board machine. 4,944,467, Cl. 242-65.000.

Societe Anonyme DIMECO ALIPRESSE: *See—*
Glorieux, Jean-Marie A.; and Gouget, Jean-Pierre M. D., 4,944,176, Cl. 72-319.000.

Societe Anonyme dite: Alcatel Satmas: *See—*
Krasuski, Marek; and Prugnolle, Bernard, 4,944,137, Cl. 53-569.000.

Societe anonyme dite: ALSTHOM: *See—*
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, 4,945,198, Cl. 200-148.00A.

Societe Anonyme dite: GEC Alsthom SA: *See—*
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, 4,945,197, Cl. 200-148.00A.

Societe Anonyme dite : STEIN INDUSTRIE: *See—*
Fournier, Jean; and Delsol, Gilbert, 4,944,254, Cl. 122-511.000.

Societe Anonyme: Sanofi: *See—*
Legoux, Richard; Leplatois, Pascal; Joseph, Evelyne L.; Niaudet, Brigitte; and Roskam, Willem, 4,945,047, Cl. 435-69.400.

Societe Dacota (S.A.): *See—*
Daigre, Jean C., 4,944,412, Cl. 211-11.000.

Societe Industrielle de Combustible Nucleaire: *See—*
Sionnet, Jean; and Renard, Paul A., 4,944,559, Cl. 299-86.000.

Societe Nationale Elf Aquitaine: *See—*
Crozat, Georges, 4,944,159, Cl. 62-112.000.

Soechtig, Wolfgang, to Krauss-Maffei A.G. Impingement mixing device with pressure controlled nozzle adjustment. 4,944,599, Cl. 366-132.000.

Sogard, David J.; and Savitt, Scott, to SciMed Life Systems, Inc. Perfusion balloon catheter. 4,944,745, Cl. 606-194.000.

Solar, Ronald J.: *See—*
Buchbinder, Maurice; and Solar, Ronald J., 4,944,740, Cl. 606-194.000.

Solomon, Irvine J.: *See—*
Erekson, Erek J.; Lee, Anthony L.; Barone, S. Peter; and Solomon, Irvine J., 4,945,078, Cl. 502-202.000.

Somed Pty. Ltd.: *See—*
Sullivan, Colin E., 4,944,310, Cl. 128-848.000.

Sommers, Valerie D., to National Child Safety Council. Puppet mouth construction. 4,944,710, Cl. 446-329.000.

Sonntag, Michael: *See—*
Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, 4,945,137, Cl. 525-375.000.

Sony Corporation: *See—*
Iwahashi, Yuji; Urayama, Kiyoshi; and Sato, Shinya, 4,945,440, Cl. 360-132.000.
Murakami, Yoshikazu; Ohgihara, Takahiro; Niikura, Kanako; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,945,324, Cl. 333-202.000.
Nishihara, Tokihiro; and Fukuda, Yasushi, 4,944,086, Cl. 79-837.000.
Suzuki, Masayuki; and Iwata, Hirokimi, 4,945,433, Cl. 360-99.070.
Yui, Yasuji; Hitachi, Akio; Sato, Tatsuru; and Shirakura, Akira, 4,945,382, Cl. 355-27.000.

Soodak, Charles I.; and Ulrich, Robert R., to American Fluoroseal Corporation. Method and apparatus for making fluorocarbon film plastic bags using a laser. 4,945,203, Cl. 219-121.640.

SORG Gmbh & Co. KG: *See—*
Sorg, Helmut; Pieper, Helmut; Zschocher, Hartmut; and Merlet, Heinz, 4,944,785, Cl. 65-136.000.

Sorg, Helmut; Pieper, Helmut; Zschocher, Hartmut; and Merlet, Heinz, to SORG Gmbh & Co. KG; and Metallgesellschaft AG. Process using melt accelerator for the conversion of solid waste substances into glass. 4,944,785, Cl. 65-136.000.

Southern, Eric: *See—*
Milner, Bruce A.; Malcolm-Brown, Tessa; and Southern, Eric, 4,945,015, Cl. 523-179.000.

Southwire Company: *See—*
Wilson, Thomas N., 4,944,469, Cl. 242-82.000.

Sova, Vladimir, to BBC Brown Boveri AG. Process for chemically stripping a surface-protection layer with a high chromium content from the main body of a component composed of a nickel-based or cobalt-based superalloy. 4,944,807, Cl. 134-3.000.

Spanjer, Tjerk G.: *See—*
Van Der Heijden, Antonius W. F.; Hellings, Gerardus J.; Himmelbauer, Erich E.; Spanjer, Tjerk G.; and Vrijssen, Gerardus A. H. M., 4,945,283, Cl. 313-450.000.

Spectrum Sciences B.V.: *See—*
Landa, Benzion; Ezuz, Shabtai; Shmaiser, Aron; Pinhas, Hanna; and Lior, Ishaiau, 4,945,387, Cl. 355-271.000.

Speltz, Laurine M.; Walworth, Bryant L.; and Pavlista, Alexander D., to American Cyanamid Company. Substituted nitro and cyanoguanidines and their use for increasing crop yields. 4,944,788, Cl. 71-88.000.

Spence, Floyd G.: *See—*
Sharanppani, Anand S. G.; Spence, Floyd G.; and Teunis, Brian D., 4,944,806, Cl. 106-493.000.

Spencer, Lee R., Jr.: *See—*
Aleckner, John F., Jr.; Cherry, David J.; and Spencer, Lee R., Jr., 4,945,005, Cl. 428-500.000.

Spies, Brian R., to Atlantic Richfield Company. Method of reducing impulsive noise in electromagnetic geophysical data. 4,945,309, Cl. 324-345.000.

Spinner, Georg. Coaxial plug-type inner conductor connection. 4,944,701, Cl. 439-827.000.

Spirex Corporation: *See—*
Colby, Paul N.; and Durina, Michael F., 4,944,906, Cl. 264-101.000.

Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, to Hoechst AG; and Vereinigte-Aluminum Werke AG. Base material for an aluminum offset printing plate. 4,945,004, Cl. 428-469.000.

Spurrier, Kevin H. Vehicle seat belt metal buckle temperature insulating cover. 4,944,530, Cl. 280-801.000.

Spyres, Gary G.: *See—*
Hartman, Guy J.; and Spyres, Gary G., 4,944,953, Cl. 426-271.000.

Stabilus GmbH: *See—*
Kortgen, Bernd; Morgen, Helmut; Heinrichs, Heinz-Josef; Fuhrmann, Castor; and Freitag, Herbert, 4,944,498, Cl. 267-64.110.

Stahl, Ira R., to Stahl, Ira R.; and John Siemiarowski. Apparatus for dispensing coiled electrical wire or cable. 4,944,472, Cl. 242-129.000.

Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Spinning machine for producing feeding packages for twisting. 4,944,145, Cl. 57-261.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,944,145, Cl. 57-261.000.

Stamatoff, James B.: *See—*
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,944,895, Cl. 252-299.010.
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,944,896, Cl. 252-587.000.

Stamicarbon B.V.: *See—*
Peerlkamp, Erik R., 4,945,152, Cl. 528-335.000.

Standley, Charles L.: *See—*
Beyer, Klaus D.; Guthrie, William L.; Makarewicz, Stanley R.; Mendel, Eric; Patrick, William J.; Perry, Kathleen A.; Piskin, William A.; Riseman, Jacob; Schaible, Paul M.; and Standley, Charles L., 4,944,836, Cl. 156-645.000.

Stanley, Timothy D.; and Bodine, John H., to Amoco Corporation. Method of geophysical exploration. 4,945,519, Cl. 367-48.000.

Stant Inc.: *See—*
Szlaga, Emil; Harris, Robert S.; and Thompson, Robert H., 4,944,779, Cl. 55-168.000.

Star Seimitsu Kabushiki Kaisha: *See—*
Suzuki, Kenji; and Sheldon, Dunstan P., 4,944,619, Cl. 400-224.200.

Stark, Sven O. S.: *See—*
Carlsson, Lars C.; Stark, Sven O. S.; and Bengtsson, Ulf, 4,944,132, Cl. 53-167.000.

Staub, Fred W., to General Electric Company. X-ray target cooling. 4,945,562, Cl. 378-130.000.

Staver Company Inc., The: *See—*
Trunk, Edmund G.; and Wilens, Seymour, 4,945,401, Cl. 357-81.000.

Stedman, Dennis F.: *See—*
Medley, Edward H.; Kreucher, Raymond N., Jr.; Stedman, Dennis F.; and Downs, Thomas R., 4,944,553, Cl. 296-188.000.

Steegmuller, Dieter: *See—*
Effenberger, Franz; and Steegmuller, Dieter, 4,945,168, Cl. 548-454.000.

Steele, James R., to Dynamic Air Inc. Continuous flow air blender for dry granular materials. 4,944,598, Cl. 366-106.000.

Steelpress (Supplies) Limited: *See—*
Bell, Alan, 4,944,644, Cl. 411-372.000.

Steenwyk, Timothy E.: *See—*
Nielsen, Edward G.; and Steenwyk, Timothy E., 4,945,221, Cl. 250-203.100.

Steinemann, Samuel G., to Instit Straumann. Electrical cable for performing stimulations and/or measurements inside a human or animal body and method of manufacturing the cable. 4,945,342, Cl. 174-113.00R.

Steiner, Karl: *See—*
Flamig, Hans; Schutte, Andreas; Schiel, Christian; Steiner, Karl; and Mullner, Josef, 4,944,089, Cl. 29-895.220.

Steiner, Kurt, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Use of sucralfate for controlling emesis and/or diarrhea. 4,945,085, Cl. 514-53.000.

Steingass, Robert W., to Task Force Tips, Inc. Multifunction nozzle. 4,944,460, Cl. 239-428.500.

Stembridge, W. Frank: *See—*
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,944,335, Cl. 141-95.000.
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,944,336, Cl. 141-95.000.

Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, to Coca-Cola Company, The. Automatic control system for filling beverage containers. 4,944,335, Cl. 141-95.000.

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Stendel, Wilhelm: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter. 4,945,165, Cl. 548-362.000.

Stenger, Karl; Strutzel, Hans; and Crass, Guenther, to Hoechst Aktiengesellschaft. Packaging film, in particular a sausage casing, based on polyamide. 4,944,970, Cl. 428-34.800.

Stephens, David N.: *See*—
Schmiechen, Ralph; Seidelmann, Dieter; Huth, Andreas; Schneider, Herbert H.; Stephens, David N.; Engelstoft, Mogens; Hansen, John B.; and Petersen, Erling. 4,945,090, Cl. 514-232.800.

Stephenson, Andrew N.: *See*—
Kuper, Jerry W.; Barrett, Joseph J.; Langert, William E.; Baker, Martin C.; and Stephenson, Andrew N., 4,944,567, Cl. 350-96.180.

Sterling Drug Inc.: *See*—
Diana, Guy D., 4,945,164, Cl. 548-247.000.

Stetter, Jorg: *See*—
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter. 4,945,165, Cl. 548-362.000.

Steuck, Michael J., to Millipore Corporation. Membrane having hydrophilic surface. 4,944,879, Cl. 210-500.270.

Stevens, David G.: *See*—
Grant, Andrew I.; MacPherson, Martyn T.; and Stevens, David G., 4,945,249, Cl. 250-461.100.

Steyr-Daimler-Puch AG: *See*—
Zedrosser, Ulrich, 4,944,109, Cl. 42-71.010.

Stiles, Alvin B.: *See*—
Pedersen, Lee A.; and Stiles, Alvin B., 4,945,079, Cl. 502-314.000.

Stine, Alan C.; and Reynolds, Joseph D., to Eaton Corporation. Resilient range interlock. 4,944,197, Cl. 74-477.000.

Stoesal, Wilfried; Beusch, Christian; Boesch, Martin; and Niggli, Peter, to Balzers Aktiengesellschaft. Crucible cover for coating installation with an electron beam source. 4,944,245, Cl. 118-726.000.

Stofko, John, to Carbocol, Inc. Composition for bonding solid lignocellulosic materials. 4,944,823, Cl. 156-283.000.

Storage Technology Corporation: *See*—
Munro, Frederick G.; Beavers, Kelly J.; Korngiebel, Ronald W.; Lucchesi, Raymond L.; and Moy, Michael E., 4,945,429, Cl. 360-92.000.
Owens, John C., 4,944,995, Cl. 428-294.000.

Storck, Karlheinz, to Carl Schenck AG. Method and apparatus for guidance and actuation of flat belt drive under external load. 4,944,714, Cl. 474-91.000.

Stork Contiweb B.V.: *See*—
Jacobs, Thomas G. M.; and De Vroome, Clemens J. M., 4,944,673, Cl. 432-59.000.

Story, Michael J.; and Flynn, Michael J., to T.I.L. Medical Ltd. Pharmaceutical delivery systems. 4,944,949, Cl. 424-451.000.

Stossel, Clifford A., to Headcorn Instrumentation Ltd. Hip prosthesis. 4,944,764, Cl. 623-23.000.

Straka, Alfred: *See*—
Lang, Hans-Walter; and Straka, Alfred, 4,944,680, Cl. 434-264.000.

Stralow, Cecil J. Mechanism for coupling subordinate machine to tractor. 4,944,649, Cl. 414-686.000.

Stransky, Werner: *See*—
Schroder, Ludwig; Stransky, Werner; Mengel, Rudolf; Raddatz, Erich; Lust, Sigmund; Linden, Gerbert; and Schneider, Gerhart, 4,944,791, Cl. 71-92.000.

Stromberg, C. Bertil; Phillips, Joseph R.; and Torregrossa, Louis O., to Kamyr, Inc. Method for reducing contamination in pulp processing. 4,944,842, Cl. 162-60.000.

Strop, Hans R.; and Perry, Richard R., to EPE Incorporated. Vegetable oil extraction process. 4,944,954, Cl. 426-417.000.

Stroud, Nicholas J.; Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Basa, Thomas P., to Asea Brown Boveri Inc. Fuse assembly, for a cutout, with accelerated arc extinction. 4,945,333, Cl. 337-176.000.

Strutzel, Hans: *See*—
Stenger, Karl; Strutzel, Hans; and Crass, Guenther, 4,944,970, Cl. 428-34.800.

Stuetz, Dagobert E.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,944,895, Cl. 252-299.010.

Stuhl, Oskar; and Wenzel, Klaus-Dieter. Process for treating tobacco and similar organic materials. 4,944,316, Cl. 131-296.000.

Stuhmer, Karl-Gerhart; and Koch, Rudolf, to Sulzer Brothers Limited. Blade-like stem for a femoral head prosthesis. 4,944,761, Cl. 623-23.000.

Stulberg, S. David: *See*—
Martinez, David M.; Carignan, Roger G.; and Stulberg, S. David, 4,944,757, Cl. 623-20.000.

Stupar, Jeffrey M.: *See*—
Goldberg, Edward M.; Melinyshyn, Lev; Jaron, Michael; and Stupar, Jeffrey M., 4,944,724, Cl. 604-118.000.

Sturans, Maris A.: *See*—
Davis, Donald E.; Ho, Cecil T.; Lieberman, Jon E.; Pfeiffer, Hans C.; and Sturans, Maris A., 4,945,246, Cl. 250-492.200.

Sturges, Daniel D. Platform oriented transportation vehicle. 4,944,360, Cl. 180-210.000.

Sturm, Elmar: *See*—
Nyfeler, Robert; Zondler, Helmut; and Sturm, Elmar, 4,945,100, Cl. 514-383.000.

Sturmer, John; and Cadwallader, John Y., to AVX Corporation. Tantalum capacitor and method of making same. 4,945,452, Cl. 361-529.000.

Sturrock, James C.: *See*—
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,944,335, Cl. 141-95.000.
Stembridge, William F.; Sturrock, James C.; and Stembridge, W. Frank, 4,944,336, Cl. 141-95.000.

Subramanian, Krishnamoorthy: *See*—
Rue, Charles V.; Pukaite, Leonard G.; and Subramanian, Krishnamoorthy, 4,944,773, Cl. 51-307.000.

Suehiro, Yoshiyuki, to Fujitsu Limited. Semiconductor device. 4,945,395, Cl. 357-40.000.

Suenaga, Hiroyoshi: *See*—
Ogawa, Atsushi; Suenaga, Hiroyoshi; and Minakawa, Kuninori, 4,944,914, Cl. 420-418.000.

Sueshige, Hiroshi; Inokawa, Akitsugu; and Bezilla, William, to Honda Giken Kogyo Kabushiki Kaisha. Power lawnmower construction. 4,944,142, Cl. 56-320.100.

Sueyoshi, Tadahiro; Yamamoto, Takayuki; and Tsuji, Masanori, to Yazaki Corporation. Electrical connector apparatus. 4,944,696, Cl. 439-595.000.

Sugawara, Kiyoto: *See*—
Urushibata, Kenichi; Sugawara, Kiyoto; and Saen, Haruo, 4,945,192, Cl. 174-94.00R.

Sugaya, Tadashi, to Matsushita Electronics Corporation. Manufacturing method of semiconductor nonvolatile memory device. 4,945,068, Cl. 437-52.000.

Sugihara, Kazuyoshi; and Arinobu, Ichiro, to Mitsubishi Denki Kabushiki Kaisha. Tripping device with burning prevention switch. 4,945,329, Cl. 335-219.000.

Sugio, Toshiko: *See*—
Tada, Shoji; Sugio, Toshiko; and Nakashima, Kuniaki, 4,945,256, Cl. 307-139.000.

Sugiyama, Tuyoshi; Takeda, Hideo; Sato, Tsunehiko; and Chikamasa, Hiroshi, to Fuji Photo Film Co., Ltd. Method of removing particles from a flexible support, and apparatus for practicing same. 4,944,808, Cl. 134-15.000.

Suhr, Robert N. Tab forming dispenser with tape passing under the cutter. 4,944,720, Cl. 493-466.000.

Suisaku Kabushiki Kaisha: *See*—
Ogawa, Yonekichi, 4,944,871, Cl. 210-169.000.

Suitco Surface, Inc.: *See*—
Suiter, James R., 4,944,514, Cl. 273-51.000.

Suiter, James R., to Suitco Surface, Inc. Floor finishing material and method. 4,944,514, Cl. 273-51.000.

Sukegawa, Tokuzo; and Tadatomo, Kazuyuki, to Tokuzo Sukegawa; and Mitsubishi Cable Industries, Ltd. Material for light emitting element and method for crystal growth thereof. 4,944,811, Cl. 148-33.100.

Sullivan, Colin E., to Somed Pty. Ltd. Device for treating snoring sickness. 4,944,310, Cl. 128-848.000.

Sullivan, John L. Portable grab bar. 4,944,478, Cl. 248-205.700.

Sulzer Brothers Limited: *See*—
Stuhmer, Karl-Gerhart; and Koch, Rudolf, 4,944,761, Cl. 623-23.000.
Willert, Hans-Georg; and Koch, Rudolf, 4,944,763, Cl. 623-23.000.

Sumi, Nario: *See*—
Baji, Toru; Kojima, Hirotsugu; Sumi, Nario; Hagiwara, Yoshimune; and Ohba, Shinya, 4,945,506, Cl. 364-736.000.

Sumitomo Chemical Company, Limited: *See*—
Nakatsuka, Iwao; and Okuno, Masami, 4,945,162, Cl. 546-20.000.
Okamoto, Yukikazu; Tagami, Manabu; Shinjo, Goro; and Tsuji, Kozo, 4,945,088, Cl. 514-132.000.

Sumitomo Electric Industries, Ltd.: *See*—
Hongo, Hiroyasu; and Takahashi, Yuji, 4,944,783, Cl. 65-3.110.
Tada, Kohji; and Kotani, Toshihiro, 4,944,834, Cl. 156-620.500.
Urushibata, Kenichi; Sugawara, Kiyoto; and Saen, Haruo, 4,945,192, Cl. 174-94.00R.
Yamauchi, Kazuhisa; Sawada, Kazuo; and Nakai, Yoshihiro, 4,944,925, Cl. 422-249.000.

Sumitomo Metal Mining Co. Ltd.: *See*—
Ishikawa, Takashi; Oshimura, Nobumitsu; and Ohmori, Kenji, 4,944,801, Cl. 75-349.000.

Sumnall, Stanley. Razor head with yieldable shaving aid. 4,944,090, Cl. 30-41.000.

Sun Microsystems, Inc.: *See*—
Malachowsky, Chris; and Priem, Curtis, 4,945,497, Cl. 364-518.000.

Sunagawa, Hiroshi, to Fuji Photo Film Co., Ltd. Optical pickup apparatus for detection of focusing error, tracking error, and information. 4,945,527, Cl. 369-44.110.

Sundholm, Patrick J.; Donnelly, Robert H.; and Kangas, Martti Y. O. Method and apparatus for coating paper and the like. 4,944,960, Cl. 427-27.000.

Sundstrand Corporation: *See*—
Crowe, Lawrence E., 4,944,344, Cl. 165-104.330.
Niggemann, Richard E., 4,944,163, Cl. 62-500.000.
Shekleton, Jack R., 4,944,152, Cl. 60-39.360.

Sundstrand Data Control, Inc.: *See*—
Blake, Graeme A.; Norling, Brian L.; and Novack, Mitchell J., 4,944,184, Cl. 73-514.000.
Groenewegen, Johannes B., 4,944,401, Cl. 206-521.000.

Sung, Rodney L., to Texaco, Inc. Motor fuel additive and ori-inhibited motor fuel composition. 4,944,770, Cl. 44-073.000.

Sunouchi, Akio: *See*—
Date, Nobuaki; Sunouchi, Akio; Saito, Syuichiro; Murata, Yoshitaka; Ogawa, Yukio; and Tezuka, Nobuo, 4,945,379, Cl. 354-441.000.
Suntory Limited: *See*—
Fukami, Harukazu; Hashimoto, Masaki; Niwata, Shinjiro; Ohtsuka, Norio; and Fujita, Fumio, 4,945,104, Cl. 514-425.000.
Super Products Corporation: *See*—
Knutson, Robert D.; Boczkiewicz, Bruce; and Wurster, James C., 4,944,258, Cl. 134-167.00C.
Suquet, Michel, to Bendix Electronics S.A. Circuit for regulating current in an inductive load. 4,944,281, Cl. 123-644.000.
Surgical Dynamics, Inc.: *See*—
Ray, Charles D., 4,944,744, Cl. 606-79.000.
Suyama, Hideo. Electronic toothbrush. 4,944,296, Cl. 128-393.000.
Suyama, Tadakazu: *See*—
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.
Suzuki, Akira, to Toshiba Kikai Kabushiki Kaisha. Method and apparatus for loading objects into evacuated treating chamber. 4,944,645, Cl. 414-217.000.
Suzuki, Hideaki; Hosoda, Kenji; Kubota, Takaharu; and Fukumoto, Yuji, to Teijin Limited. Standard materials for measurement of immune complexes and method for measurement of immune complexes. 4,945,039, Cl. 435-7.000.
Suzuki, Kenji; and Sheldon, Dunstan P., to Star Seimitsu Kabushiki Kaisha; and Mag-Tek Inc. Construction for mounting an ink ribbon cassette in a heat transferable line printer. 4,944,619, Cl. 400-224.200.
Suzuki, Koji; Nagahira, George; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, to Canon Kabushiki Kaisha. Power source device. 4,945,255, Cl. 307-17.000.
Suzuki, Masayuki; and Iwata, Hirokimi, to Sony Corporation. Ejecting mechanism of disk cartridges. 4,945,433, Cl. 360-99.070.
Suzuki, Seigo: *See*—
Muramatsu, Kunio; and Suzuki, Seigo, 4,945,518, Cl. 365-233.000.
Suzuki, Syuji, to NEC Corporation. Optical wavelength-division multiplex transmission system with an optical filter for spontaneous emission noise. 4,945,531, Cl. 370-3.000.
Suzuki, Takashi: *See*—
Kobayashi, Atsushi; Suzuki, Takashi; and Kosugi, Yasuhiko, 4,945,383, Cl. 355-30.000.
Suzuki, Toshimitsu; Sakaguchi, Masakazu; Miyata, Yoshiyuki; and Mori, Tomoyuki, to Pola Chemical Industries Inc., Japan. Heterocyclic derivatives and radiosensitizing agents and antiviral agents comprising same as their active component. 4,945,102, Cl. 514-398.000.
Suzuki, Toshio: *See*—
Abe, Ichiro; and Suzuki, Toshio, 4,944,832, Cl. 156-584.000.
Suzuki, Yasuhiro; Yoshikawa, Tuguo; Shibata, Kazuhiro; Fukui, Akio; and Shiga, Kiyotaka, to Aisan kogyo Corporation; and Fuji Seiko Corporation. Vertical feed type burnishing drill. 4,944,640, Cl. 408-211.000.
Suzuki, Yoshihumi: *See*—
Kato, Shigeki; and Suzuki, Yoshihumi, 4,944,615, Cl. 400-124.000.
Suzuki, Yoshio: *See*—
Ueda, Ken; Umetani, Keiji; and Suzuki, Yoshio, 4,945,552, Cl. 378-99.000.
Svagr, Alexandr; Bogendorfer, Hans; Riebschlager, Klaus; Reismann, Hans-Jurgen; and Wenig, Hubertus, to SMS Schloemann-Siemag Aktiengesellschaft. Universal rolling mill stand with adjustable sets of horizontal rolls and vertical rolls. 4,944,175, Cl. 72-225.000.
Svanberg, Joakim A.; Kilstrom, Lars G.; Tuvin, Lars G.; and Larsson, Anders E. C., to Aktiebolaget Electrolux. Suction cleaner. 4,944,065, Cl. 15-327.00C.
Svenska Tobaks AB: *See*—
Thal, Martin, 4,944,317, Cl. 131-348.000.
Svensson, Ulf M.: *See*—
Carlsson, Bo P. I.; and Svensson, Ulf M., 4,944,272, Cl. 123-438.000.
Swars, Helmut, to Emitec Gesellschaft fur Emissionstechnologie mbH. Probe for hydraulic expansion, including centering device. 4,944,173, Cl. 72-62.000.
Sweetana, Andrew S., Jr.: *See*—
Stroud, Nicholas J.; Sweetana, Andrew S., Jr.; Brown, Frederick J.; and Basa, Thomas P., 4,945,333, Cl. 337-176.000.
Swiatosz, Edmund; and Grimmer, Paul D., to United States of America, Navy. Timed oxygen breathing apparatus trainer. 4,944,293, Cl. 128-205.240.
Swinderman, Robert T., to Martin Engineering Company. Scraper for conveyor belts. 4,944,386, Cl. 198-499.000.
Swint, Sandra A.: *See*—
Policastro, Peter P.; Hernandez, Pamela K.; Swint, Sandra A.; Davis, Gary C.; Rich, Jonathan D.; McDermott, Philip J.; and Guggenheim, Thomas L., 4,945,147, Cl. 528-26.000.
Sylverst, Leroy M.: *See*—
Buenos, Anne M.; Buenos, Jane M.; and Sylverst, Leroy M., 4,944,041, Cl. 2-84.000.
Syntex (U.S.A.) Inc.: *See*—
Litman, David; Zuk, Robert; and Rowley, Gerald, 4,945,205, Cl. 219-121.720.
Synthelabo: *See*—
George, Pascal; and Sevrin, Mireille, 4,945,096, Cl. 514-307.000.
Syoji, Mitsuo: *See*—
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, 4,945,335, Cl. 340-426.000.
Systecon, Inc.: *See*—
Rishel, James B., 4,945,491, Cl. 364-510.000.
Szlaga, Emil; Harris, Robert S.; and Thompson, Robert H., to Stant Inc. Vapor recovery system. 4,944,779, Cl. 55-168.000.
T.I.L. Medical Ltd.: *See*—
Story, Michael J.; and Flynn, Michael J., 4,944,949, Cl. 424-451.000.
T-Star Industrial Electronics Corp.: *See*—
Truty, Thomas J.; Fricke, William R.; Ceriale, James M.; French, Jule L.; and Newell, Kevin M., 4,945,200, Cl. 219-69.120.
Tabai Espec Corporation: *See*—
Ito, Yoshio, 4,944,125, Cl. 52-171.000.
Tabata, Hajime: *See*—
Yokoya, Noboru; and Tabata, Hajime, 4,945,271, Cl. 310-91.000.
Tackett, Wendell D., to Allied-Signal Inc. Solenoid valve. 4,944,331, Cl. 137-625.650.
Tada, Kohji; and Kotani, Toshihiro, to Sumitomo Electric Industries, Ltd. Process of pulling a crystal. 4,944,834, Cl. 156-620.500.
Tada, Shoji; Sugio, Toshiko; and Nakashima, Kuniaki, to Mitsubishi Denki Kabushiki Kaisha. Device for producing even closing of a circuit breaker. 4,945,256, Cl. 307-139.000.
Tadatomo, Kazuyuki: *See*—
Sukegawa, Tokuzo; and Tadatomo, Kazuyuki, 4,944,811, Cl. 148-33.100.
Tagami, Manabu: *See*—
Okamoto, Yukikazu; Tagami, Manabu; Shinjo, Goro; and Tsuji, Kozo, 4,945,088, Cl. 514-132.000.
Tago, Yasuyoshi: *See*—
Maeda, Koichi; Takigawa, Akio; Tago, Yasuyoshi; and Yoshida, Motoaki, 4,944,584, Cl. 351-172.000.
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, to Hitachi, Ltd. Electroluminescence device. 4,945,009, Cl. 428-690.000.
Tai, Hiromichi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 4,945,423, Cl. 358-300.000.
Taig, Alistair G., to Allied-Signal Inc. Electrically actuated braking system. 4,944,372, Cl. 188-156.000.
Taise Corporation: *See*—
Takeno, Masahiro; Sakai, Yoshihito; and Shirato, Atsushi, 4,944,243, Cl. 118-305.000.
Takagi, Osamu: *See*—
Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yumio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, 4,945,374, Cl. 354-304.000.
Takahara, Toshiyuki; and Takami, Akira, to Mitsubishi Denki Kabushiki Kaisha. Angular velocity modulating device. 4,944,718, Cl. 475-16.000.
Takahashi, Hideo, to Hitachi. Ltd. Hierarchy multi-processor system and control method therefor. 4,945,470, Cl. 364-200.000.
Takahashi, Hiroyuki; and Shiratori, Yoshitaka, to Mitsubishi Kinzoku Kabushiki Kaisha. Coolant supply nozzle apparatus for slicing machine. 4,944,121, Cl. 51-267.000.
Takahashi, Kazuyoshi: *See*—
Suzuki, Koji; Nagahira, George; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,945,255, Cl. 307-17.000.
Takahashi, Kenji: *See*—
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, 4,944,799, Cl. 75-501.000.
Takahashi, Nagashige; and Ouchi, Teruo, to Asahi Kogaku Kogyo K.K. Flexible tube of endoscope. 4,944,287, Cl. 128-4.000.
takahashi, Naoki: *See*—
Hosotani, Osamu; Kawauchi, Koichi; and takahashi, Naoki, 4,945,535, Cl. 371-11.100.
Takahashi, Osamu: *See*—
Sakai, Minoru; Takahashi, Osamu; and Aoki, Kozo, 4,945,031, Cl. 430-393.000.
Takahashi, Takashi; and Endo, Kinichi, to Takahashi, Takashi. Controlling transmission. 4,944,195, Cl. 74-409.000.
Takahashi, Tokuyuki; Ito, Hiroshi; and Kubo, Seitoku, to Toyota Jidosha Kabushiki Kaisha. Planetary gear type speed change device having one-way clutch operable in two functions. 4,944,719, Cl. 475-281.000.
Takahashi, Yasushi: *See*—
Hasegawa, Shumpei; Takahashi, Yasushi; and Mishima, Yoshibumi, 4,944,266, Cl. 123-302.000.
Takahashi, Yuji: *See*—
Hongo, Hiroyasu; and Takahashi, Yuji, 4,944,783, Cl. 65-3.110.
Takai, Toshihiso: *See*—
Asano, Kazuo; Takai, Toshihiso; and Takito, Mitsuke, 4,944,668, Cl. 425-397.000.
Takami, Akira: *See*—
Takahara, Toshiyuki; and Takami, Akira, 4,944,718, Cl. 475-16.000.
Takami, Katsuhiro: *See*—
Kurita, Yoshio; Takami, Katsuhiro; Tanaka, Kenji; and Kosumi, Yuji, 4,945,398, Cl. 357-74.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, to Victor Company of Japan, Ltd. Reproducing apparatus for charge latent image recording medium. 4,945,423, Cl. 358-300.000.

Takara Co., Ltd.: *See*—
Kawabe, Haruo, 4,944,708, Cl. 446-175.000.
Takasaki, Shigeru, to NEC Corporation. Hardware simulator capable of reducing an amount of information. 4,945,503, Cl. 364-578.000.
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, to Minolta Camera Kabushiki Kaisha; and Osaka Municipal Government. Photosensitive member comprising bisazo pigment. 4,945,021, Cl. 430-76.000.
Takatsu, Nariyasu; and Nakashima, Hidenobu, to Colin Electronics Co., Ltd. Blood pressure monitoring apparatus. 4,944,305, Cl. 128-683.000.
Takechi, Moriaki: *See*—
Kuroda, Shigenori; and Takechi, Moriaki, 4,945,446, Cl. 361-146.000.
Takeda Chemical Industries, Ltd.: *See*—
Kikuchi, Masakazu; Yoshimura, Koji; and Nakahama, Kazuo, 4,945,051, Cl. 435-172.300.
Uchihori, Yuji; Sekitani, Yasushi; and Yoshida, Ikuo, 4,945,048, Cl. 435-105.000.
Takeda, Hideo: *See*—
Sugiyama, Tuyoshi; Takeda, Hideo; Sato, Tsunehiko; and Chikamasa, Hiroshi, 4,944,808, Cl. 134-15.000.
Takei, Akira: *See*—
Ito, Susumu; Sato, Tomokazu; Ozaki, Katsuya; Shikata, Shitsuw; Okamoto, Kikuhiko; Inoue, Shigeo; Koike, Kenzo; Ota, Yuichi; and Takei, Akira, 4,945,053, Cl. 435-209.000.
Takeichi, Hideo: *See*—
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, 4,945,002, Cl. 428-425.600.
Takeno, Masahiro; Sakai, Yoshihito; and Shirato, Atsushi, to Taise Corporation. Apparatus for automatically painting external wall of building. 4,944,243, Cl. 118-305.000.
Takesa, Taichi: *See*—
Matsumoto, Takashi; and Takesa, Taichi, 4,945,438, Cl. 360-121.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,945,081, Cl. 514-30.000.
Takeuchi, Toru; and Matsuzawa, Minoru, to Orion Machinery Co., Ltd. Vacuum-pressure supply device. 4,944,249, Cl. 119-14.440.
Taki, Waro: *See*—
Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, 4,944,746, Cl. 606-195.000.
Takigawa, Akio: *See*—
Maeda, Koichi; Takigawa, Akio; Tago, Yasuyoshi; and Yoshida, Motoaki, 4,944,584, Cl. 351-172.000.
Takito, Mitusuke: *See*—
Asano, Kazuo; Takai, Toshihiso; and Takito, Mitusuke, 4,944,668, Cl. 425-397.000.
Tal, Amir, to Rotal Industries & Trading Ltd. Joystick assembly. 4,945,357, Cl. 341-20.000.
Talbott, Alex F. Mailing device and machine-readable business card. 4,945,218, Cl. 235-487.000.
Talwar, Anil K.; and Carlin, Edward J., to Warner-Lambert Company. Taste masking of thymol. 4,945,087, Cl. 514-60.000.
Tamura, Katsumi: *See*—
Taguchi, Kazuo; Fuyama, Moriaki; Onisawa, Kenichi; Tamura, Katsumi; Ono, Yoshimasa; Abe, Yoshio; Nakayama, Takahiro; Sato, Akira; and Hashimoto, Kenichi, 4,945,009, Cl. 428-690.000.
Tanabe, Haruyoshi; Kawakami, Masahiro; Takahashi, Kenji; Iwasaki, Katsuhiro; and Inoue, Shigeru, to NKK Corporation. Method of producing stainless molten steel by smelting reduction. 4,944,799, Cl. 75-501.000.
Tanabe, Takeshi; Ide, Kenzi; and Ohouchi, Mituo, to Sharp Kabushiki Kaisha. Wireless bar code reader. 4,945,216, Cl. 235-462.000.
Tanaka, Akihiro: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,945,081, Cl. 514-30.000.
Tanaka, Akira. Speed control means and apparatus for a repeatable material processing apparatus. 4,944,143, Cl. 57-93.000.
Tanaka, Haruo; Mushiage, Masato; and Ishida, Yuhji, to Rohm Co., Ltd. Molecular beam epitaxy apparatus. 4,944,246, Cl. 118-729.000.
Tanaka, Haruo; and Nakata, Naotaroh, to Rohm Co., Ltd. Diode laser pumped solid-state laser. 4,945,544, Cl. 372-70.000.
Tanaka, Hatsuyuki; Kobayashi, Masakazu; Wakiya, Kazumasa; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Remover solution for resist. 4,944,893, Cl. 252-171.000.
Tanaka, Kenji: *See*—
Kurita, Yoshio; Takami, Katsuhiro; Tanaka, Kenji; and Kosumi, Yuji, 4,945,398, Cl. 357-74.000.
Tanaka, Kenmei, to Kanzaki Paper Mfg. Form overlay type printing apparatus. 4,944,614, Cl. 400-68.000.
Tanaka, Kiichiro: *See*—
Fukushige, Fumio; Hori, Hisanobu; and Tanaka, Kiichiro, 4,944,613, Cl. 400-61.000.
Tanaka, Masafumi, to Japan Storage Battery Company Limited. Storage battery provided with electrolytic solution stirring device. 4,945,011, Cl. 429-81.000.
Tanaka, Masaki. Composite calling card for social and business data and use. 4,945,219, Cl. 235-488.000.
Tanaka, Toshiaki; Nishikawa, Morihisa; Ozaki, Yoshio; Akamatsu, Kooji; Nakata, Masahiro; and Taneda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge machining method and device. 4,945,199, Cl. 219-69.130.
Taneda, Atsushi: *See*—
Tanaka, Toshiaki; Nishikawa, Morihisa; Ozaki, Yoshio; Akamatsu, Kooji; Nakata, Masahiro; and Taneda, Atsushi, 4,945,199, Cl. 219-69.130.
Tang, Jordan J. N.; and Wang, Chi-Sun, to Oklahoma Medical Research Foundation. Dietary compositions and methods using bile salt-activated lipase. 4,944,944, Cl. 424-94.600.
Tange, Keigo; Kanada, Tomohisa; and Hirota, Shingo, to Minolta Camera Kabushiki Kaisha. Method and apparatus for cleaning a color image forming apparatus by sticking developer on the photoconductor without forming an image. 4,945,388, Cl. 355-296.000.
Tani, Hisashi: *See*—
Yagi, Hisanori; Hamada, Kousuke; Nakano, Isamu; Nishimura, Yoshihiro; Matsubayashi, Hajime; and Tani, Hisashi, 4,944,959, Cl. 427-14.100.
Taniwaki, Michio: *See*—
Nagaoka, Shinji; Seki, Yoichi; Saito, Hiroyuki; and Taniwaki, Michio, 4,945,378, Cl. 354-429.000.
Tanji, Masaki; and Nishijima, Toyoki, to Konica Corporation. Silver halide photographic light-sensitive material. 4,945,034, Cl. 430-546.000.
Tanoue, Akifumi; Kono, Hiromi; and Satoh, Yuji, to Diesel Kiki Co., Ltd. Backup control means for shift lever of an automatic transmission systems. 4,944,194, Cl. 74-335.000.
Tanuma, Itsuo; Takeichi, Hideo; Segawa, Masashi; and Honda, Toshio, to Bridgestone Corporation. Impact-resisting anti-lacerative window units. 4,945,002, Cl. 428-425.600.
Task Force Tips, Inc.: *See*—
Steingass, Robert W., 4,944,460, Cl. 239-428.500.
Taylor, Harold J.: *See*—
Goodley, George R.; and Taylor, Harold J., 4,945,151, Cl. 528-272.000.
Taylor, Stanley: *See*—
Nix, Elvin L.; and Taylor, Stanley, 4,945,240, Cl. 250-330.000.
Tecator AB: *See*—
Nordqvist, Karl G., 4,944,589, Cl. 356-326.000.
Technicon Instruments Corporation: *See*—
Mawhirt, James A.; DiFlora, Joseph E.; McCandless, William J. C.; and Ward, George H., 4,944,924, Cl. 422-104.000.
Techow, Claudius: *See*—
Gotzen, L.; Kunze, Karl-Heinz; and Techow, Claudius, 4,944,743, Cl. 606-61.000.
Teijin Limited: *See*—
Suzuki, Hideaki; Hosoda, Kenji; Kubota, Takaharu; and Fukumoto, Yuji, 4,945,039, Cl. 435-7.000.
Teixeira, Joao C.: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.
Tel Yamanashi Limited: *See*—
Uchida, Mizuki; and Hara, Kozo, 4,944,542, Cl. 294-86.400.
Teldix GmbH: *See*—
Hettlage, Eckart; and Ruff, Gerd, 4,945,320, Cl. 333-106.000.
Telectro-Mek, Inc.: *See*—
Miller, Michael R., 4,944,876, Cl. 210-321.750.
Teledyne Industries, Inc.: *See*—
Washington, Bruce A., 4,944,639, Cl. 408-176.000.
Telex Communications: *See*—
Denison, William W., 4,944,578, Cl. 350-347.00E.
Temeyer, Kevin B.; Haufler, Maurice; and Pruett, John H., to United States of America, Agriculture. Monoclonal antibodies to crystal protein of *Bacillus thuringiensis* subspecies *israelensis*. 4,945,057, Cl. 435-240.270.
Ten Bruggencate, Cornelis A.; Montijn, Andreas N.; and Van Keimpema, Gerrit J., to Koninklijke Emballage Industrie Van Leer B. V. Container with integral foldable handle. 4,944,399, Cl. 206-509.000.
Tennant, Brent A.: *See*—
Cushman, Michael R.; Nicely, Vincent A.; Tennant, Brent A.; and Zoeller, Joseph R., 4,945,075, Cl. 502-24.000.
Terabe, Kuniyuki: *See*—
Mundstock, Rene; Terabe, Kuniyuki; de Almeida Lamprecht, Antonio R.; Teixeira, Joao C.; Batista, Altair R. D.; Dias, Edson d.; Santos, Luiz D.; Amorim, Osvaldo; Rezende, Joel; Filho, Jorge H.; Gobbo, Joao C.; and Machado, Romeu, 4,944,867, Cl. 208-409.000.
Teradata Corporation: *See*—
Neches, Philip M., 4,945,471, Cl. 364-200.000.
Teramoto, Kazunari: *See*—
Kimura, Rokuro; Hayakawa, Kizo; Ogo, Kazutaka; Teramoto, Kazunari; Ito, Isao; Goto, Akihiro; and Kuwano, Yoshimasa, 4,945,487, Cl. 364-474.020.
Terashima, Tsuneo: *See*—
Kobayashi, Yoichi; Kan, Tatsuhiko; and Terashima, Tsuneo, 4,944,952, Cl. 426-42.000.
Terumo Kabushiki Kaisha: *See*—
Naoi, Keiji, 4,944,884, Cl. 210-692.000.
Teschner, Rainer: *See*—
Eckardt, Helmut; Ehritt, Jurgen; Bockenheimer, Alexander; and Teschner, Rainer, 4,944,909, Cl. 264-255.000.
Teske, Steven K.: *See*—
Oleson, John C.; Teske, Steven K.; Iturzaeta, Richard F.; and Langer, Erwin E., 4,944,647, Cl. 414-412.000.

Tetra Pak Holdings & Finance S.A.: *See*—
Rausing, Hans, 4,944,408, Cl. 206-628.000.
Tetratec Corporation: *See*—
Dillon, Joseph A.; and Dillon, Mark E., 4,945,125, Cl. 527-427.000.
Teumer, Christopher R.; and Mendes, Mark A., to Rochester Telephone Corporation. Method and means for remote testing of unused telephone lines. 4,945,555, Cl. 379-21.000.
Teunis, Brian D.: *See*—
Sharangpani, Anand S. G.; Spence, Floyd G.; and Teunis, Brian D., 4,944,806, Cl. 106-493.000.
Texaco, Inc.: *See*—
Sung, Rodney L., 4,944,770, Cl. 44-073.000.
Texas Instruments, Incorporated: *See*—
Carter, Duane E., 4,945,069, Cl. 437-67.000.
Penz, Perry A.; Gately, Michael T.; and Katz, Alan J., 4,945,494, Cl. 364-513.000.
Tezuka, Nobuo: *See*—
Date, Nobuaki; Sunouchi, Akio; Saito, Syuichiro; Murata, Yoshitaka; Ogawa, Yukio; and Tezuka, Nobuo, 4,945,379, Cl. 354-441.000.
TFC Corporation: *See*—
Fox, Asthony, 4,944,220, Cl. 100-90.000.
Thal, Martin, to Svenska Tobaks AB. Tobacco portion. 4,944,317, Cl. 131-348.000.
Thaler, Warren A.: *See*—
Ho, S. Winston; Sartori, Guido; Thaler, Warren A.; and Dalrymple, David C., 4,944,880, Cl. 210-640.000.
Theberge, John E.: *See*—
Crosby, Jane M.; and Theberge, John E., 4,945,126, Cl. 524-507.000.
Thermo Electron Technologies Corp.: *See*—
MacDonald Bruce G.; Hulburd, William G.; and LaBelle, Raymond A., 4,944,580, Cl. 350-611.000.
Thetford Corporation: *See*—
Sargent, Charles L.; and Antos, John M., 4,944,048, Cl. 4-323.000.
Thiele, Harmut; Gruber, Leo; and Toral, Jose , to Reel/Frame 5189/0412 Agfa-Gevaert Aktiengesellschaft. Packing container. 4,944,407, Cl. 206-628.000.
Thiemann, Daniel A.: *See*—
Cornish, Darrell G.; Mally, Timothy G.; Thiemann, Daniel A.; and Thompson, Bjorn J., 4,944,603, Cl. 383-5.000.
Thierer, Heinz: *See*—
Trippner, Edmund; and Thierer, Heinz, 4,944,341, Cl. 160-98.000.
Thierry, Jean Pierre: *See*—
Mailly, Regis; Thierry, Jean Pierre; and Verdenne, Serge, 4,944,687, Cl. 439-207.000.
Thomas & Betts Corporation: *See*—
Daly, C. David; and Khoshnood, Ben, 4,945,229, Cl. 250-227.110.
Thomas, Willie L.: *See*—
Bullat, David M.; and Thomas, Willie L., 4,944,074, Cl. 24-602.000.
Thome, John R., to Motorola, Inc. Bonding verification process incorporating test patterns. 4,944,447, Cl. 228-103.000.
Thompson, Bjorn J.: *See*—
Cornish, Darrell G.; Mally, Timothy G.; Thiemann, Daniel A.; and Thompson, Bjorn J., 4,944,603, Cl. 383-5.000.
Thompson, Bruce W.: *See*—
Iannarone, John R.; and Thompson, Bruce W., 4,945,548, Cl. 375-4.000.
Thompson, Michael B.: *See*—
Malone, Peter J.; Thompson, Michael B.; Torrence, Robert J.; and Gaudette, Marvin F., 4,944,160, Cl. 62-180.000.
Thompson, Robert H.: *See*—
Szlaga, Emil; Harris, Robert S.; and Thompson, Robert H., 4,944,779, Cl. 55-168.000.
Thompson, Ted L., to Micron Technology, Inc. Automatic preform dispenser. 4,944,446, Cl. 228-102.000.
Thomson-CSF: *See*—
Aigrain, Pierre; Mourey, Bruno; Dubois, Jean C.; Hareng, Michel; and Robin, Philippe, 4,944,575, Cl. 350-333.000.
Arques, Marc, 4,945,243, Cl. 250-367.000.
Arques, Marc, 4,945,419, Cl. 358-213.110.
Auger, Gerard; Laurent, Pierre A.; and Mocchi, Patrick, 4,945,312, Cl. 325-345.000.
Berger, Jean-Luc; and Arques, Marc, 4,945,242, Cl. 250-367.000.
Berger, Jean-Luc; and Arques, Marc, 4,945,420, Cl. 358-213.310.
Thorn EMI plc: *See*—
Nix, Elvin L.; and Taylor, Stanley, 4,945,240, Cl. 250-330.000.
Thornton, David C.: *See*—
Keyser, Lloyd A.; Nelson, Donald A.; and Thornton, David C., 4,944,776, Cl. 55-16.000.
Thorpe, Thurman C.: *See*—
Turner, James E.; Thorpe, Thurman C.; Di Guiseppi, James L.; and Driscoll, Richard C., 4,945,060, Cl. 435-291.000.
Thrower, Anthony; and Gelsthorpe, John R., to Injectall Limited. Apparatus for injecting gas into high temperature liquids, e.g. molten metals. 4,944,496, Cl. 266-220.000.
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, to Societe Anonyme dite: GEC Alsthom SA. High tension circuit breaker including a dielectric gas used for blasting. 4,945,197, Cl. 200-148.00A.
Thuries, Edmond; Dufournet, Denis; and Perret, Michel, to Societe anonyme dite: ALSTHOM. High tension circuit breaker with low operating energy. 4,945,198, Cl. 200-148.00A.
Tijima, Hiromi, to Kabushiki Kaisha Daikin Seisakusho. Damper disk. 4,944,499, Cl. 267-154.000.
Timm, Edward E.: *See*—
Dubensky, Ellen M.; and Timm, Edward E., 4,945,073, Cl. 501-93.000.
Ting, Sai-Pei, to General Electric Company. Control of surface gloss by variation of hips rubber swell index in polyphenylene ether composition. 4,945,131, Cl. 525-68.000.
Toba, Koichi: *See*—
Yamagata, Kiyohiro; Abe, Nobumasa; Toba, Koichi; Kobayashi, Atsushi; and Watanabe, Koji, 4,945,381, Cl. 355-27.000.
Toda, Haruhisa; Fujihisa, Hiroaki; and Murata, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker with smooth sliding operation. 4,945,325, Cl. 335-16.000.
Toda, Hideaki: *See*—
Kagawa, Seiji; Toda, Hideaki; and Nomura, Shinichiro, 4,945,127, Cl. 524-524.000.
Toho Gas Co., Ltd.: *See*—
Tsuchiya, Mitsuo; Matsubara, Masafumi; Mori, Yoshihiro; and Itami, Hideo, 4,944,283, Cl. 126-41.00R.
Toho Titanium Co., Ltd.: *See*—
Matsunami, Hiroshi; Maehara, Kunio; and Kosemura, Susumu, 4,944,859, Cl. 204-244.000.
Tojo, Toshio, to Hitachi, Ltd.; and Hitachi Device Engineering Co., Ltd. Cathode ray tube and method of making the same. 4,944,706, Cl. 445-8.000.
Toki, Satoshi: *See*—
Kasugai, Joji; Toki, Satoshi; and Hosokawa, Norikazu, 4,944,425, Cl. 220-203.000.
Tokico Ltd.: *See*—
Watanabe, Takashi; and Kobayashi, Fujio, 4,944,459, Cl. 239-305.000.
Tokita, Makiko: *See*—
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, 4,944,988, Cl. 428-195.000.
Tokoro, Setsuo, to Toyota Jidosha Kabushiki Kaisha. Drive control device for vehicle. 4,945,483, Cl. 364-424.100.
Tokuda, Akira: *See*—
Kurauchi, Yasuhiro; Akazawa, Michihiro; Harada, Tsuneo; Oyama, Kiyotaka; and Tokuda, Akira, 4,944,852, Cl. 204-131.000.
Tokuzo Sukegawa: *See*—
Sukegawa, Tokuzo; and Tadatomo, Kazuyuki, 4,944,811, Cl. 148-33.100.
Tokyo Ohka Kogyo Co., Ltd.: *See*—
Tanaka, Hatsuyuki; Kobayashi, Masakazu; Wakiya, Kazumasa; and Nakayama, Toshimasa, 4,944,893, Cl. 252-171.000.
Tolley, Sherman D. Wall stud centering square. 4,944,096, Cl. 33-480.000.
Tomaschewski, Horst H.: *See*—
Mergel, Dieter; Ney, Hermann; and Tomaschewski, Horst H., 4,945,566, Cl. 381-41.000.
Tomita, Masahiro: *See*—
Kawasaki, Takeshi; Endo, Junji; Isakozawa, Shigeto; Tomita, Masahiro; and Tonomura, Akira, 4,945,247, Cl. 250-423.00F.
Tomiyama, Hideki; Karino, Yukio; and Hayashi, Hiroshi, to Fuji Photo Film Co., Ltd. Image receiving element for use in a silver salt diffusion transfer process. 4,945,026, Cl. 430-233.000.
Tonel, Valerio: *See*—
Sartor, Mariano; and Tonel, Valerio, 4,944,100, Cl. 36-120.000.
Tonen Sekiyukagaku Kabushiki Kaisha: *See*—
Kagawa, Seiji; Toda, Hideaki; and Nomura, Shinichiro, 4,945,127, Cl. 524-524.000.
Tonomura, Akira: *See*—
Kawasaki, Takeshi; Endo, Junji; Isakozawa, Shigeto; Tomita, Masahiro; and Tonomura, Akira, 4,945,247, Cl. 250-423.00F.
Topcon Corporation: *See*—
Katsuragi, Kenjiro, 4,944,303, Cl. 128-648.000.
Toral, Jose : *See*—
Thiele, Harmut; Gruber, Leo; and Toral, Jose , 4,944,407, Cl. 206-628.000.
Toray Industries Inc.: *See*—
Shiromoto, Keigo; Adachi, Yasuo; and Nabae, Kiyoyuki, 4,944,932, Cl. 423-447.600.
Torikoshi, Yuichi: *See*—
Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwase, Kazuyuki; and Nakano, Toshifumi, 4,945,372, Cl. 354-199.000.
Tornblom, Bengt, to Tornbloms Kvalitetskontroll AB. Electronic device for detecting irregularities in a surface of a solid object. 4,945,307, Cl. 324-225.000.
Tornbloms Kvalitetskontroll AB: *See*—
Tornblom, Bengt, 4,945,307, Cl. 324-225.000.
Torng, Chen Ching. Polygen fish globe. 4,944,248, Cl. 119-5.000.
Torre, Randall J. Bone gripping fixation clamp. 4,944,739, Cl. 606-53.000.
Torregrossa, Louis O.: *See*—
Stromberg, C. Bertil; Phillips, Joseph R.; and Torregrossa, Louis O., 4,944,842, Cl. 162-60.000.
Torrence, Robert J.: *See*—
Malone, Peter J.; Thompson, Michael B.; Torrence, Robert J.; and Gaudette, Marvin F., 4,944,160, Cl. 62-180.000.
Tortorich, Rainey. Aerodynamic bicycle cover. 4,944,340, Cl. 150-167.000.

Toshiba Battery Co., Ltd.: *See*—
Miyabayashi, Mitsutaka; Nishii, Toshifumi; Yui, Hiroshi; Inada, Kuniaki; Ikeda, Katsuji; Nose, Hiroyoshi; and Tsuchiya, Kenji, 4,945,014, Cl. 429-218.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Suzuki, Akira, 4,944,645, Cl. 414-217.000.

Tosi, Robert B.: *See*—
Nelson, John; and Tosi, Robert B., 4,944,367, Cl. 184-29.000.

Toso Organic Chemical Co., Ltd.: *See*—
Matsuura, Shinichi; and Miyano, Osamu, 4,945,186, Cl. 568-433.000.

Tosoh Corporation: *See*—
Hayashi, Hidechika, 4,944,922, Cl. 422-100.000.
Kurauchi, Yasuhiro; Akazawa, Michihiro; Harada, Tsuneo; Oyama, Kiyotaka; and Tokuda, Akira, 4,944,852, Cl. 204-131.000.

Tou, James C.; and Rulf, Donald C., to Dow Chemical Company, The. Permeation measurement device. 4,944,180, Cl. 73-38.000.

Townsend Engineering Company: *See*—
Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., 4,944,069, Cl. 17-49.000.

Townsend, Ray T.; Smith, David W.; and Dykes, Robert M., to Townsend Engineering Company. Encased product and method and apparatus for encasing same. 4,944,069, Cl. 17-49.000.

Toy, Madeline S.; and Carter, Melvin K. Method for detecting organic compounds by photoacoustic conversion. 4,945,063, Cl. 436-85.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Satsuka, Mamoru; and Furusawa, Hironobu, 4,945,191, Cl. 174-69.000.

Toyoda Gosei Co., Ltd.: *See*—
Kasugai, Joji; Toki, Satoshi; and Hosokawa, Norikazu, 4,944,425, Cl. 220-203.000.
Murachi, Tatsuya, 4,945,016, Cl. 524-81.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Iwatsuki, Kunihiro; Shindo, Yoshio; Hayashi, Kazahiko; Sasaoka, Hiroshi; Hamano, Yukio; Sakurai, Keita; Izumi, Fumiaki; and Kashihara, Yuji, 4,945,481, Cl. 364-424.100.
Nishikawa, Seiichi; Harada, Yoshiharu; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,945,482, Cl. 364-424.100.
Ohya, Hideshi; Miyatani, Takao; Kawamura, Keiji; and Kawabata, Yasutomo, 4,945,231, Cl. 250-231.140.
Takahashi, Tokuyuki; Ito, Hiroshi; and Kubo, Seitoku, 4,944,719, Cl. 475-281.000.
Tokoro, Setsuo, 4,945,483, Cl. 364-424.100.

Tranergy Corporation: *See*—
Kumar, Sudhir; Kumar, Shiv R.; and Becker, Dean A., 4,944,539, Cl. 291-2.000.

Tratar, Michael F.: *See*—
Bremenour, Edwin L.; Tratar, Michael F.; and Pepera, Gerald S., 4,945,448, Cl. 361-383.000.

Treiber, Fritz F., to Hobart Corporation. Package wrapping and weighing system. 4,944,135, Cl. 53-502.000.

Trest "Juzhvodoprovod" : *See*—
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., 4,944,353, Cl. 172-23.000.

Tribert, John, to NCR Corporation. Encoder employing a shock absorbing tension spring. 4,944,617, Cl. 400-157.200.

Trinity Industries, Inc.: *See*—
Hesch, Harold E., 4,944,234, Cl. 105-378.000.

Trippner, Edmund; and Thierer, Heinz. Insulating glass window with light guard. 4,944,341, Cl. 160-98.000.

Trombley, Ken. Hair styling device. 4,944,319, Cl. 132-238.000.

Trommer, Gerd: *See*—
Poisel, Hans; and Trommer, Gerd, 4,944,590, Cl. 356-350.000.

Trummer, Guenther; Koerber, Richard; and Mehltretter, Ludwig, to Messerschmitt-Boelkow-Blohm GmbH. Radar altimeter. 4,945,360, Cl. 342-122.000.

Trunk, Edmund G.; and Wilens, Seymour, to Staver Company Inc., The. Heat dissipator for semiconductor unit. 4,945,401, Cl. 357-81.000.

Truswal Systems Corporation: *See*—
Bennett, Janice M., 4,945,492, Cl. 364-512.000.

Truty, Thomas J.; Fricke, William R.; Ceriale, James M.; French, Jule L.; and Newell, Kevin M., to Fort Wayne Wire Die, Inc.; and T-Star Industrial Electronics Corp. Electrical discharge machine apparatus moving wire electrode guide assembly. 4,945,200, Cl. 219-69.120.

TRW, Inc.: *See*—
Leibowitz, Joseph D., 4,944,684, Cl. 439-76.000.

Tscheplak, Ernst: *See*—
Worner, Gunter; and Tscheplak, Ernst, 4,944,712, Cl. 464-67.000.

Tsinberg, Mikhail: *See*—
Cavallerano, Alan P.; Basile, Carlo; and Tsinberg, Mikhail, 4,945,411, Cl. 358-141.000.

Tsubai, Kyozo. Seat belt handle assembly. 4,944,557, Cl. 297-468.000.

Tsubakimoto Chain Company: *See*—
Hara, Fumihiko; Hayashi, Shuji; and Yamada, Genjiro, 4,945,295, Cl. 318-490.000.

Tsuchida, Shigeki: *See*—
Konishi, Masao; and Tsuchida, Shigeki, 4,945,430, Cl. 360-92.000.

Tsuchiya, Kenji: *See*—
Miyabayashi, Mitsutaka; Nishii, Toshifumi; Yui, Hiroshi; Inada, Kuniaki; Ikeda, Katsuji; Nose, Hiroyoshi; and Tsuchiya, Kenji, 4,945,014, Cl. 429-218.000.

Tsuchiya, Mitsuo; Matsubara, Masafumi; Mori, Yoshihiro; and Itami, Hideo, to Paloma Kogyo Kabushiki Kaisha; and Toho Gas Co., Ltd. Gas burner. 4,944,283, Cl. 126-41.00R.

Tsuchiya, Shohei, to Hosokawa Printing Co., Ltd. Forging-by-copying-proof prints. 4,944,533, Cl. 283-93.000.

Tsuchiya, Tsutomu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,945,081, Cl. 514-30.000.

Tsuchiya, Yutaka: *See*—
Koishi, Musubu; Tsujimura, Etsuo; Watanabe, Motoyuki; and Tsuchiya, Yutaka, 4,945,224, Cl. 250-213.0VT.

Tsudakoma Corp.: *See*—
Nakade, Kiyoshi, 4,944,078, Cl. 28-183.000.

Tsuji, Kozo: *See*—
Okamoto, Yukikazu; Tagami, Manabu; Shinjo, Goro; and Tsuji, Kozo, 4,945,088, Cl. 514-132.000.

Tsuji, Masanori; Murakami, Yoshihiro; and Yamanashi, Makoto, to Yazaki Corporation. Connector terminal retaining construction. 4,944,695, Cl. 439-595.000.

Tsuji, Masanori: *See*—
Sueyoshi, Tadahiro; Yamamoto, Takayuki; and Tsuji, Masanori, 4,944,696, Cl. 439-595.000.

Tsujikawa, Muneo: *See*—
Horii, Hajime; Kawabe, Haruhide; Arimura, Hirofumi; Mukai, Hiromichi; Kobayashi, Kaoru; Tsujikawa, Muneo; Nishida, Masayuki; and Suyama, Tadakazu, 4,945,046, Cl. 435-69.300.

Tsujimura, Etsuo: *See*—
Koishi, Musubu; Tsujimura, Etsuo; Watanabe, Motoyuki; and Tsuchiya, Yutaka, 4,945,224, Cl. 250-213.0VT.

Tsuneda, Masayuki: *See*—
Maeda, Hajime; and Tsuneda, Masayuki, 4,944,230, Cl. 104-139.000.

Tufty, Lyle R.: *See*—
Boigenzahn, Jeffrey F.; Bratvold, Darrell E.; Rigotti, James M.; and Tufty, Lyle R., 4,945,435, Cl. 360-106.000.

Tunker, Gerhard: *See*—
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,944,964, Cl. 427-203.000.

Turback, Victor S.: *See*—
Kingsley, I. Steven; and Turback, Victor S., 4,944,957, Cl. 426-643.000.

Turner, Gregory P.; and Riley, David S., to Horsell Graphics Industries Limited. Method for developing lithographic plates comprising a developer comprising ethylene oxide/propylene oxide block copolymers. 4,945,030, Cl. 430-331.000.

Turner, James E.; Thorpe, Thurman C.; Di Guiseppi, James L.; and Driscoll, Richard C., to Akzo N. V. Device for detecting microorganisms. 4,945,060, Cl. 435-291.000.

Tuttle, Kenneth A.; and Corrado, James, to Rorer Pharmaceutical Corporation. Apparatus for applying wrappers. 4,944,829, Cl. 156-497.000.

Tuvin, Lars G.: *See*—
Svanberg, Joakim A.; Kilstrom, Lars G.; Tuvin, Lars G.; and Larsson, Anders E. C., 4,944,065, Cl. 15-327.00C.

Twilley, Ian C.: *See*—
Mason, Charles D.; Young, John A.; Haylock, John C.; and Twilley, Ian C., 4,945,129, Cl. 525-66.000.

Tyren, Carl H., to Atech Aktiebolag. Printer device with noise reducing impact hammer. 4,944,222, Cl. 101-93.290.

Uchida, Hiroshi: *See*—
Yamashita, Takaji; and Uchida, Hiroshi, 4,945,241, Cl. 250-367.000.

Uchida, Mizuki; and Hara, Kozo, to Tel Yamanashi Limited. Support device. 4,944,542, Cl. 294-86.400.

Uchihori, Yuji; Sekitani, Yasushi; and Yoshida, Ikuo, to Takeda Chemical Industries, Ltd. Process for producing L-sorbose by subculture of seed. 4,945,048, Cl. 435-105.000.

Udding, Anne C., to Shell Oil Company. Process for the preparation of carboxylated propylene polymers. 4,945,136, Cl. 525-351.000.

Uecker, Kenneth D., to Burdick Corporation. Self-contained printhead/paperdrive mechanism. 4,944,621, Cl. 400-691.000.

Ueda, Ken; Umetani, Keiji; and Suzuki, Yoshio, to Hitachi, Ltd. Imaging system for obtaining X-ray energy subtraction images. 4,945,552, Cl. 378-99.000.

Ueda, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Gate array device. 4,945,513, Cl. 365-51.000.

Ueda, Seitaro; Okubo, Yukio; Izumi, Shinichiro; and Hoshiro, Takeshi, to Hitachi Metals, Ltd.; and Mitsuboshi Belting Ltd. Chain for V-pulley. 4,944,715, Cl. 474-245.000.

Ueda, Takamasa: *See*—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.

Ueda, Tomoaki, to Daikin Industries, Ltd. Image memory write control apparatus and texture mapping apparatus. 4,945,495, Cl. 364-518.000.

Ueda, Yoshizumi: *See*—
Yanai, Akira; and Ueda, Yoshizumi, 4,945,058, Cl. 435-252.300.

Ueno, Sadayasu: *See*—
Itsuji, Takayuki; Ueno, Sadayasu; and Ichikawa, Norio, 4,944,274, Cl. 123-489.000.

Uhrin, Robert: *See*—
Belt, Roger F.; and Uhrin, Robert, 4,944,833, Cl. 156-617.100.

Ulrich, Donald R.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,944,895, Cl. 252-299.010.

Ulrich, Robert R.: *See*—
Soodak, Charles I.; and Ulrich, Robert R., 4,945,203, Cl. 219-121.640.
Umetani, Keiji: *See*—
Ueda, Ken; Umetani, Keiji; and Suzuki, Yoshio, 4,945,552, Cl. 378-99.000.
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, to Yamanouchi Pharmaceutical Co., Ltd. Mycaminosyl tylonolide derivatives. 4,945,081, Cl. 514-30.000.
Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,945,081, Cl. 514-30.000.
Uncle Ben's Inc.: *See*—
Zehnal, Sally A., 4,944,406, Cl. 206-621.400.
Underwood, Lance D.: *See*—
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,944,774, Cl. 51-309.000.
Unger, Liliane: *See*—
Franke, Albrecht, deceased; Schlecker, Rainer; Gries, Josef; Von Philipsborn, Gerda; and Unger, Liliane, 4,945,114, Cl. 514-652.000.
Union Carbide Chemicals and Plastics Company Inc.: *See*—
Papa, Anthony J.; and Bryant, David R., 4,945,185, Cl. 568-387.000.
Union Oil Company of California: *See*—
Young, Donald C., 4,944,787, Cl. 71-28.000.
Unipatent Holding S.A.: *See*—
Ewert, Charles, 4,944,213, Cl. 89-14.300.
Uniroyal Chemical Company, Inc.: *See*—
Nowakowski, Mark A.; and Bell, Allyn R., 4,945,113, Cl. 514-605.000.
Unisys Corp.: *See*—
Ackerson, Bruce D.; Paker, Stephen J.; and Wahlquist, Clayton C., 4,945,292, Cl. 315-387.000.
DeKarske, Clarence W.; and Peterson, Aaron C., 4,945,512, Cl. 365-49.000.
Rusterholz, John T.; Homan, Charles J.; Brown, Lowell E.; Bennett, Donald B.; Malnati, Robert J.; and Hamstra, James R., 4,945,479, Cl. 364-200.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Jones, Robin; and Ridley, Kevin D., 4,945,227, Cl. 250-214.00R.
Robbins, David J., 4,945,254, Cl. 250-571.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Trade and Industry in Her Britannic Majesty's Government of the: *See*—
Lindsey, Kevin; and Smith, Stuart T., 4,944,606, Cl. 384-42.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See*—
Bugga, Ratnakumar V.; Distefano, Salvador; Nagasubramanian, Ganesan; and Bankston, Clyde P., 4,945,012, Cl. 429-103.000.
Agriculture: *See*—
Temeyer, Kevin B.; Haußer, Maurice; and Pruett, John H., 4,945,057, Cl. 435-240.270.
Army: *See*—
Farr, John F., 4,945,248, Cl. 250-493.100.
Sayles, David C., 4,944,816, Cl. 149-19.800.
Walsh, Michael R., 4,944,543, Cl. 294-86.290.
Energy: *See*—
Hammond, Peter R.; and Feeman, James F., 4,945,176, Cl. 549-227.000.
National Aeronautics and Space Administration: *See*—
Simon, Marvin K.; and Divasalar, Dariush, 4,945,549, Cl. 375-53.000.
Navy: *See*—
Allen, John H.; and Reif, Robert S., 4,944,679, Cl. 434-2.000.
Bullat, David M.; and Thomas, Willie L., 4,944,074, Cl. 24-602.000.
Consaga, John P., 4,944,815, Cl. 149-19.100.
Swiatosz, Edmund; and Grimmer, Paul D., 4,944,293, Cl. 128-205.240.
U.S. Philips Corporation: *See*—
Brilka, Joachim C.; and Weltersbach, Wolfgang, 4,945,313, Cl. 329-349.000.
Crasemann, Jan H., 4,945,528, Cl. 369-59.000.
Kunze, Norbert, 4,945,431, Cl. 360-96.500.
Marinus, Antonius A. M.; Miermans, Hubertus C.; and De Bondt, Guy L. P., 4,945,465, Cl. 363-89.000.
Mergel, Dieter; Ney, Hermann; and Tomaschewski, Horst H., 4,945,566, Cl. 381-41.000.
Phillips, John L.; and Ball, Robert P., 4,945,286, Cl. 313-105.0CM.
Van Den Bungelaar, Martinus J., 4,945,314, Cl. 330-2.000.
Van Der Heijden, Antonius W. F.; Hellings, Gerardus J.; Himmelbauer, Erich E.; Spanjer, Tjerk G.; and Vrijssen, Gerardus A. H. M., 4,945,283, Cl. 313-450.000.
Willems, Leonardus F., 4,945,568, Cl. 381-50.000.
United Technologies Corporation: *See*—
Murphy, Kenneth S.; Hendricks, Robert E.; and Fenton, Richard J., 4,944,858, Cl. 204-192.150.
Univ. of British Columbia: *See*—
Carr, Owen R., 4,944,689, Cl. 439-417.000.
Universal Builders Supply, Inc.: *See*—
Shalders, Alan J., 4,944,365, Cl. 182-138.000.
University Medical Center, Inc.: *See*—
Miller, Ernest C., 4,944,397, Cl. 206-365.000.
University of California, Regents of the: *See*—
Holt, J. Birch; Kingman, Donald D.; and Bianchini, Gregory M., 4,944,930, Cl. 423-344.000.
University of Cincinnati: *See*—
Day, Richard A., 4,945,159, Cl. 540-215.000.
University of Florida: *See*—
Boyle, Michael D. P.; and Faulmann, Ervin, 4,945,157, Cl. 530-409.000.
University of Queensland: *See*—
Doddrell, David M.; and Brooks, William M., 4,945,308, Cl. 324-309.000.
University of Southern California: *See*—
Rubinstein, Alan I., 4,944,920, Cl. 422-37.000.
University of Texas System, The: *See*—
Kimble, Harry J.; Pereira, Silvania F.; and Walls, Daniel F., 4,944,592, Cl. 356-364.000.
UOP: *See*—
Abrevaya, Hayim, 4,945,116, Cl. 518-715.000.
Hobbs, Simon H.; and Gosling, Christopher D., 4,945,175, Cl. 585-417.000.
Uppco Incorporated: *See*—
Lautner, Max; Hoffman, Fred; and Melnikov, Edward, 4,944,085, Cl. 29-732.000.
Upton, James E.: *See*—
Doan, Phong D.; Cobian, Kenneth E.; Upton, James E.; and Haeg, Daniel C., 4,944,088, Cl. 29-858.000.
Urayama, Kiyoshi: *See*—
Iwahashi, Yuji; Urayama, Kiyoshi; and Sato, Shinya, 4,945,440, Cl. 360-132.000.
Uresil Corporation: *See*—
Goldberg, Edward M.; Melinyshyn, Lev; Jaron, Michael; and Stupar, Jeffrey M., 4,944,724, Cl. 604-118.000.
Urushibata, Kenichi; Sugawara, Kiyoto; and Saen, Haruo, to Sumitomo Electric Industries, Ltd. Connector terminal. 4,945,192, Cl. 174-94.00R.
Usmani, Kal. Central vacuum cleaner with detachable filter assembly. 4,944,780, Cl. 55-337.000.
Uster, Paul S.; Fielding, Robert M.; and Martin, Francis J., to Liposome Technology, Inc. EGF/Liposome gel composition and method. 4,944,948, Cl. 424-450.000.
Usui Kokusai Sangyo Kaisha Ltd.: *See*—
Usui, Masayoshi; and Washizu, Katsushi, 4,944,537, Cl. 285-319.000.
Usui, Masayoshi; and Washizu, Katsushi, to Usui Kokusai Sangyo Kaisha Ltd. Small-diameter pipe connector. 4,944,537, Cl. 285-319.000.
Usui, Nobutane. Multipurpose board like article for decoration and amusement. 4,944,969, Cl. 428-14.000.
Usui, Noriyuki; and Satoh, Tsumori, to Ricoh Company, Ltd. Method of cleaning a photoconductive element of an image recorder. 4,945,389, Cl. 355-296.000.
Vachek, Josef: *See*—
Gerstenberg, Bruno; Michling, Hans J.; and Vachek, Josef, 4,945,323, Cl. 333-185.000.
Vahab, Christian, to Robolase Systems, Inc. Laser time-sharing system. 4,945,489, Cl. 364-505.000.
Valchev, Peter V.: *See*—
Lyakov, Nedyalko K.; Haralampiev, Georgi A.; Nikolov, Todor G.; Buyukliev, Georgi S.; Petrov, Peter S.; Valchev, Peter V.; Myuftiev, Valcho P.; and Primov, Kalin T., 4,944,869, Cl. 209-173.000.
Valeo: *See*—
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Van Den Bungelaar, Martinus J., to U.S. Philips Corporation. Amplifier arrangement with saturation detection. 4,945,314, Cl. 330-2.000.
van den Honert, Christopher: *See*—
Widin, Gregory P.; and van den Honert, Christopher, 4,944,301, Cl. 128-420.600.
van de Pol, Hendrick: *See*—
Hardy, Kimber; van de Pol, Hendrick; Grindley, June; and Payton, Mark A., 4,945,052, Cl. 435-172.300.
Van Der Heijden, Antonius W. F.; Hellings, Gerardus J.; Himmelbauer, Erich E.; Spanjer, Tjerk G.; and Vrijssen, Gerardus A. H. M., to U.S. Philips Corporation. Cathode ray tube having a tubular focus structure. 4,945,283, Cl. 313-450.000.
Van Der Sanden, Josephus A. Apparatus for freezing liquid-carrying pipes. 4,944,161, Cl. 62-293.000.
Vandor Corporation: *See*—
Kay, William M.; and Elder, Bruce E., 4,944,075, Cl. 27-14.000.
Van Herck, Willy: *See*—
Van Royen, Luc; Putseys, Roland; Van Herck, Willy; Sluyts, Domien; Pype, Robert; and Brandle, Karl, 4,944,929, Cl. 423-235.000.
Van Keimpema, Gerrit J.: *See*—
Ten Bruggencate, Cornelis A.; Montijn, Andreas N.; and Van Keimpema, Gerrit J., 4,944,399, Cl. 206-509.000.
Van Loo, Robert H.: *See*—
Cordia, Johannes M.; Evans, Roger W.; and Van Loo, Robert H., 4,944,987, Cl. 428-192.000.
Van Onstein, Elco T. J. M.; and Leebeek, Antonius C. G., to Procter & Gamble Company, The. Self-supporting storage, shipping and display assembly. 4,944,400, Cl. 206-509.000.

Van Royen, Luc; Putseys, Roland; Van Herck, Willy; Sluyts, Domien; Pype, Robert; and Brandle, Karl, to Bayer Aktiengesellschaft. Process for the removal of nitrogen oxide from flue gases. 4,944,929, Cl. 423-235.000.

Varian Associates, Inc.: *See*—
Gunn, Bradley R., 4,945,464, Cl. 363-61.000.

Vassallo, Jayson C.: *See*—
Dabi, Shmuel; and Vassallo, Jayson C., 4,944,963, Cl. 427-195.000.

Vayman, Zinovy Y.: *See*—
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., 4,945,065, Cl. 437-4.000.

Vazquez, Jose R.: *See*—
Wedertz, Larry D.; Vazquez, Jose R.; and Schoneman, Scott R., 4,944,226, Cl. 102-476.000.

VDO Adolf Schindling AG: *See*—
Mann, Arnold, 4,944,267, Cl. 123-339.000.

Vdoviak, John W.: *See*—
Motsinger, Russell E.; and Vdoviak, John W., 4,944,362, Cl. 181-213.000.

Veba Oel Technologie GmbH: *See*—
Fuhrmann, Klaus; Graeser, Ulrich; and Merz, Ludwig, 4,944,866, Cl. 208-408.000.

Veitscher Magnestiwerke-Actien-Gesellschaft: *See*—
Grill, Michael; and Graf, Gerhard, 4,944,928, Cl. 423-161.000.

VELA S.r.l.: *See*—
Zarotti, Claudio, 4,944,044, Cl. 2-413.000.

Velke, David C., Sr.; Marsden, George P.; and Leffingwell, Burton C. Splicing connector. 4,944,699, Cl. 439-784.000.

Vent-Plant Corporation: *See*—
Linkow, Leonard I.; Armini, Anthony J.; and Rinaldi, Anthony W., 4,944,754, Cl. 623-16.000.

Verdenne, Serge: *See*—
Mailly, Regis; Thierry, Jean Pierre; and Verdenne, Serge, 4,944,687, Cl. 439-207.000.

Vereinigte-Aluminum Werke AG.: *See*—
Sprintschnik, Gerhard; Niederstaetter, Walter; Reiss, Kurt; Asten, Wolfgang V.; Scharf, Gunther; and Grzemba, Barbara, 4,945,004, Cl. 428-469.000.

Verkruyse, Linda A.: *See*—
Grey, Roger A.; Karas, Lawrence J.; and Verkruyse, Linda A., 4,944,346, Cl. 166-274.000.

Verna, Maurice: *See*—
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Verrecchia, Roger: *See*—
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Versa Cap, Inc.: *See*—
Drown, Donald L.; Runge, Richard O.; and Brumenshenkel, Elmer L., 4,944,550, Cl. 296-100.000.

Verton, Jose, to Champion Spark Plug Europe S.A. Wiper blade with retention means. 4,944,064, Cl. 15-250.420.

Vester, Markus: *See*—
Oppelt, Ralph; and Vester, Markus, 4,945,321, Cl. 333-119.000.

Via Provinciale: *See*—
Giorgetti, Alberto, 4,944,371, Cl. 188-73.390.

Vibration Mountings & Controls, Inc.: *See*—
LeKuch, Herbert W.; Kulik, Herbert S.; and Lucia, Nicholas J., Jr., 4,944,403, Cl. 206-594.000.

Victor Company of Japan, Ltd.: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 4,945,423, Cl. 358-300.000.

Videonics Incorporated: *See*—
Hahn, Mark C., 4,945,425, Cl. 360-15.000.

Villette, Alain, to Bristol-Myers-Squibb Company. Process and apparatus for devitalization of a tooth. 4,944,678, Cl. 433-224.000.

Vohland, Marion G.; Odom, Edwin M.; and Harris, Herbert H., Jr., to General Electric Company. Method and apparatus for storing and dispensing environmentally sensitive materials. 4,944,671, Cl. 432-8.000.

Vollink, Dan H.: *See*—
Jarrett, William E., 4,944,480, Cl. 248-309.100.

Von Gonten, William D., Jr. Combination downhole tubing circulating valve and fluid unloader and method. 4,944,349, Cl. 166-304.000.

Von Kohorn, Henry. Glare-free illuminating apparatus. 4,945,460, Cl. 362-290.000.

Von Philipsborn, Gerda: *See*—
Franke, Albrecht, deceased; Schlecker, Rainer; Gries, Josef; Von Philipsborn, Gerda; and Unger, Liliane, 4,945,114, Cl. 514-652.000.

Von Stetten, Susan M., to Armstrong World Industries, Inc. Charge dissipative floor tiles. 4,944,998, Cl. 428-327.000.

Vrijssen, Gerardus A. H. M.: *See*—
Van Der Heijden, Antonius W. F.; Hellings, Gerardus J.; Himmelbauer, Erich E.; Spanjer, Tjerk G.; and Vrijssen, Gerardus A. H. M., 4,945,283, Cl. 313-450.000.

Vu, Duy-Phach: *See*—
Allen, Lisa P.; Vu, Duy-Phach; Batty, Michael W.; Morrision, Richard H., Jr.; and Zavracky, Paul M., 4,944,835, Cl. 156-620.700.

W. Schlafhorst & Co.: *See*—
Raasch, Hans, 4,944,463, Cl. 242-18.0DD.

Wacker-Chemie GmbH: *See*—
Dorsch, Norman, 4,944,989, Cl. 428-319.700.

Waelbroeck, Francois: *See*—
Shmayda, Walter T.; Waelbroeck, Francois; Wienhold, Peter; and Winter, Joerg, 4,944,777, Cl. 55-16.000.

Wagner, Eugene. Placemat with changeable card display. 4,944,968, Cl. 428-13.000.

Wagnon Power Jack, Inc.: *See*—
Bartholomew, Alan; and Williams, Jack J., 4,944,323, Cl. 137-227.000.

Wahlquist, Clayton C.: *See*—
Ackerson, Bruce D.; Paker, Stephen J.; and Wahlquist, Clayton C., 4,945,292, Cl. 315-387.000.

Waite, Diana H.; Chance, Nathan H., Jr.; and Edmiston, Robert A., to Airrigation Engineering Co., Inc. Chemical control of root growth in sewers and the like. 4,944,320, Cl. 134-167.00C.

Wakiya, Kazumasa: *See*—
Tanaka, Hatsuyuki; Kobayashi, Masakazu; Wakiya, Kazumasa; and Nakayama, Toshimasa, 4,944,893, Cl. 252-171.000.

Waldo, Ellen J., to International Business Machines Corporation. Method of managing a media library. 4,945,428, Cl. 360-92.000.

Waldschmidt, Kenneth P. Two-handled shovel. 4,944,541, Cl. 294-58.000.

Walker, Edward T., to Dock Leveler Manufacturing, Inc. Dock leveler control system. 4,944,062, Cl. 14-71.300.

Walker, Joseph W.: *See*—
Batts, Felix M.; and Walker, Joseph W., 4,945,458, Cl. 362-106.000.

Wall, Carole, to Abby Brooks Corporation. Prenatal body support. 4,944,059, Cl. 5-431.000.

Wall, Hans. Public sanitary cubicle. 4,944,052, Cl. 4-662.000.

Wallace Computer Services, Inc.: *See*—
Schmidt, Eric, 4,944,449, Cl. 229-73.000.
Schmidt, Eric, 4,944,450, Cl. 229-73.000.

Wallace, Karen L.; and Lee, Dolk, to Dow Chemical Company, The. Interpolymers having color and heat stability as well as oxygen barrier properties. 4,945,134, Cl. 525-301.000.

Wallace, Kenneth O. Soft baby bottle. 4,944,418, Cl. 215-100.00R.

Wallace, Peter L.; and Willis, Anthony J., to Wiggins Teape Group Limited, The. Process and apparatus for forming particulate layers. 4,944,843, Cl. 162-101.000.

Wallach, Donald F. H., to Micro Vesicular Systems, Inc. Biodegradable incontinence device with embedded granules. 4,944,734, Cl. 604-358.000.

Walling, Paul J., to Professional Satellite Imaging, Inc. Satellite communications system for medical related images. 4,945,410, Cl. 358-141.000.

Walls, Daniel F.: *See*—
Kimble, Harry J.; Pereira, Silvania F.; and Walls, Daniel F., 4,944,592, Cl. 356-364.000.

Walsh, Dennis E.: *See*—
Smith, C. Morris; and Walsh, Dennis E., 4,944,863, Cl. 208-107.000.

Walsh, Michael R., to United States of America, Army. Ice auger extractor for retrieving augers or similar devices from a bore hole. 4,944,543, Cl. 294-86.290.

Walworth, Bryant L.: *See*—
Speltz, Laurine M.; Walworth, Bryant L.; and Pavlista, Alexander D., 4,944,788, Cl. 71-88.000.

Wampfler, David J.: *See*—
Pawloski, Chester E.; Fielding, Donna J.; and Wampfler, David J., 4,945,118, Cl. 521-107.000.

Wampler, Richard K.: *See*—
Carriker, John W.; and Wampler, Richard K., 4,944,722, Cl. 600-16.000.

Wamprecht, Christian: *See*—
Schafer, Walter; Rudolph, Hans; Dhein, Rolf; Muller, Hanns-Peter; Sonntag, Michael; Wamprecht, Christian; Blum, Harald; and Krauss, Walter, 4,945,137, Cl. 525-375.000.

Wang, Chi-Sun: *See*—
Tang, Jordan J. N.; and Wang, Chi-Sun, 4,944,944, Cl. 424-94.600.

Wang, Yun-Terng: *See*—
Wu, Jaw-Shyong; Wang, Yun-Terng; Wu, Harn-Chang; and Shieh, Jiin-Tsong, 4,944,106, Cl. 43-15.000.

Wanger, Mark E.: *See*—
Jones, David P.; and Wanger, Mark E., 4,944,082, Cl. 29-467.000.

Ward, George H.: *See*—
Mawhirt, James A.; DiFlora, Joseph E.; McCandless, William J. C.; and Ward, George H., 4,944,924, Cl. 422-104.000.

Warner-Lambert Company: *See*—
Kiely, John S.; Lesheski, Lawrence E.; and Schroeder, Mel C., 4,945,160, Cl. 540-481.000.
Talwar, Anil K.; and Carlin, Edward J., 4,945,087, Cl. 514-60.000.

Warner & Swasey Company, The: *See*—
Bell, Frederick K.; Brown, Stephen N.; and Gale, Michael T., 4,945,501, Cl. 364-571.050.

Warren, Timothy J.: *See*—
Morland, Albert H.; and Warren, Timothy J., 4,944,899, Cl. 264-1.400.

Warwas, Edwin J.: *See*—
Manzer, Leo E.; Rao, V. N. Mallikarjuna; Rockwell, Richard T.; Sisk, Michael A.; Warwas, Edwin J.; and Winteringham, Roy, 4,944,846, Cl. 203-1.000.

Washington, Bruce A., to Teledyne Industries, Inc. Thread cutting device. 4,944,639, Cl. 408-176.000.

Washington, Carroll M. Separated circuit hot spark producing apparatus. 4,944,280, Cl. 123-627.000.

Washizu, Katsushi: *See*—
Usui, Masayoshi; and Washizu, Katsushi, 4,944,537, Cl. 285-319.000.

Wasserman, Phillip D.: *See*—
Mallory, Chester L.; Wasserman, Phillip D.; Pham, Hung V.; and Broome, Barry G., 4,945,220, Cl. 250-201.300.
Watanabe, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for an a.c. generator for automobile. 4,945,299, Cl. 322-33.000.
Watanabe, Koji: *See*—
Yamagata, Kiyohiro; Abe, Nobumasa; Toba, Koichi; Kobayashi, Atsushi; and Watanabe, Koji, 4,945,381, Cl. 355-27.000.
Watanabe, Motoyuki: *See*—
Koishi, Musubu; Tsujimura, Etsuo; Watanabe, Motoyuki; and Tsuchiya, Yutaka, 4,945,224, Cl. 250-213.0VT.
Watanabe, Sharky. Automatic coffee brewing apparatus. 4,944,217, Cl. 99-280.000.
Watanabe, Shingo; and Murakami, Shohei, to NCR Corporation. Passbook read/write mechanism. 4,944,616, Cl. 400-105.000.
Watanabe, Takashi; and Kobayashi, Fujio, to Tokico Ltd. Mounting-/dismounting system for mounting and dismounting a spray gun on and from a painting robot. 4,944,459, Cl. 239-305.000.
Watkins, Joseph J.: *See*—
Fagerburg, David R.; Rule, Mark; Watkins, Joseph J.; and Lawrence, Paul B., 4,945,155, Cl. 528-480.000.
Watson, James E., to North American Manufacturing Co. Self-cleaning burner. 4,944,670, Cl. 431-166.000.
Watts FluidAir Div. of Robertshaw Controls Company: *See*—
Nelson, John; and Tosi, Robert B., 4,944,367, Cl. 184-29.000.
Watts, Marcella; and Wrice, Johnnie M. Adjustable sun visor. 4,944,547, Cl. 296-97.800.
Wazaki, Yoshio; and Oono, Tetsuya, to Honda Giken Kogyo Kabushiki. Driving wheel slip control system for vehicles. 4,944,358, Cl. 180-197.000.
Webasto AG Fahrzeugtechnik: *See*—
Goerlich, Dieter; Kolodzie, Rainer; and Reiter, Rainer, 4,944,153, Cl. 60-303.000.
Widemann, Friedrich; Kahnau, Guenter; Kohse, Richard; and Raethel, Dieter, 4,944,454, Cl. 237-12.30C.
Weber Aircraft, Inc.: *See*—
Harris, David S., 4,944,552, Cl. 297-145.000.
Weber, Mathias: *See*—
Dick, Helmut; Gradel, Wolf-Dietrich; and Weber, Mathias, 4,945,181, Cl. 564-212.000.
Webster, Jeffery D.: *See*—
Crouse, Gary D.; and Webster, Jeffery D., 4,944,795, Cl. 71-98.000.
Wedertz, Larry D.; Vazquez, Jose R.; and Schoneman, Scott R., to General Dynamics Corp., Pomona Div. Expandable telescoped missile airframe. 4,944,226, Cl. 102-476.000.
Wedge, Philip J.; and Wharmby, David, to British Gas plc. Apparatus for heating a vessel. 4,944,674, Cl. 432-158.000.
Wee, Siok-Hui H., to ICI Americas Inc. Certain 2-(disubstituted amino) acetanilide herbicides. 4,944,796, Cl. 71-118.000.
Weigand, Eckehard: *See*—
Kopp, Richard; Oertel, Gunter; Weigand, Eckehard; and Wiedermaan, Rolf, 4,945,120, Cl. 521-163.000.
Weil, Hans-Hermann: *See*—
Knecht, Adolf; Daab, Ottfried; and Weil, Hans-Hermann, 4,944,433, Cl. 222-402.200.
Weisman, Ilan; Shapira, Roni; Shafir, Roni; and Shtark, Hanoh. Dop for gemstone handling during manufacture. 4,944,120, Cl. 51-165.720.
Weller, Hugo: *See*—
Nitschke, Werner; Weller, Hugo; and Drobny, Wolfgang, 4,945,486, Cl. 364-431.110.
Weltersbach, Wolfgang: *See*—
Brilka, Joachim C.; and Weltersbach, Wolfgang, 4,945,313, Cl. 329-349.000.
Wendt, Alan C. Horizontally oriented demountable partition system. 4,944,122, Cl. 52-36.000.
Wenig, Hubertus: *See*—
Svagr, Alexandr; Bogendorfer, Hans; Riebschlager, Klaus; Reismann, Hans-Jurgen; and Wenig, Hubertus, 4,944,175, Cl. 72-225.000.
Wentker, Stephan: *See*—
Knabel, Walter; Mayer, Josef; and Wentker, Stephan, 4,944,531, Cl. 280-806.000.
Wenzel, Klaus-Dieter: *See*—
Stuhl, Oskar; and Wenzel, Klaus-Dieter, 4,944,316, Cl. 131-296.000.
Werth, John: *See*—
Kaufman, Arthur; and Werth, John, 4,945,010, Cl. 429-26.000.
West, Roland J. Pliers with adjustable jaw means. 4,944,204, Cl. 81-385.000.
West, Weldon D.: *See*—
Buckberg, Gerald D.; Maloney, James V., Jr.; Jones, Kenneth A.; and West, Weldon D., 4,944,729, Cl. 604-164.000.
Westech Systems, Inc.: *See*—
Gill, Gerald L., Jr.; and Hyde, Thomas C., 4,944,119, Cl. 51-215.00R.
Westeppe, Uwe; Lindner, Christian; Piejko, Karl-Erwin; and Merten, Josef, to Bayer Aktiengesellschaft. Impact resistant polyamide moulding compounds modified with silicone graft rubbers. 4,945,124, Cl. 525-63.000.
Western Atlas International, Inc.: *See*—
Jorro, Robert V. J., 4,945,233, Cl. 250-252.100.
Westinghouse Electric Corp.: *See*—
Adam, John D., 4,944,857, Cl. 204-192.150.
Catanese, John A.; and Saunders, Susan R., 4,944,856, Cl. 204-129.200.
Clark, William G., Jr.; and Junker, Warren R., 4,944,185, Cl. 73-579.000.
Westvaco Corporation: *See*—
Forbes, Hampton E., Jr., 4,944,451, Cl. 229-120.170.
Schilling, Peter, 4,944,804, Cl. 106-277.000.
Wharmby, David: *See*—
Wedge, Philip J.; and Wharmby, David, 4,944,674, Cl. 432-158.000.
Whirlpool Corporation: *See*—
Carper, Dwight A., 4,944,566, Cl. 312-311.000.
Whitaker, Gary W.: *See*—
Lindstrom, Terry D.; and Whitaker, Gary W., 4,945,080, Cl. 514-29.000.
Whitaker, James: *See*—
Haugland, Richard P.; and Whitaker, James, 4,945,171, Cl. 549-224.000.
Whitcomb, William C.: *See*—
Gibbs, James L.; Laird, James A.; Lee, George W.; and Whitcomb, William C., 4,944,905, Cl. 264-62.000.
Whiteley, Thomas G.; and Cavender, Travis W., to Halliburton Company. One-trip washdown system and method. 4,944,348, Cl. 166-278.000.
Wible, John E.; and Grohsmeyer, Paul D., to Caterpillar Industrial Inc. Power transferring arrangement. 4,944,357, Cl. 180-169.000.
Widemann, Friedrich; Kahnau, Guenter; Kohse, Richard; and Raethel, Dieter, to Webasto AG Fahrzeugtechnik. Heater, in particular vehicle auxiliary heater, with a temperature safety mechanism. 4,944,454, Cl. 237-12.30C.
Widin, Gregory P.; and van den Honert, Christopher, to Cochlear Corporation. Method for determining absolute current density through an implanted electrode. 4,944,301, Cl. 128-420.600.
Widmann, Marcel; and Hickey, James H., to BTL Specialty Resins Corp. Particulate thermosetting adhesive compositions. 4,945,000, Cl. 428-407.000.
Wiechert, Rudolf: *See*—
Hofmeister, Helmut; Laurent, Henry; Schulze, Paul E.; Annen, Klaus; Wiechert, Rudolf; Pollow, Kunhard; Manz, Bernhard; and Grill, Hans-Joerg, 4,945,064, Cl. 436-503.000.
Wiedermann, Rolf: *See*—
Kopp, Richard; Oertel, Gunter; Weigand, Eckehard; and Wiedermann, Rolf, 4,945,120, Cl. 521-163.000.
Wiener, Alan I.; and Hundal, Waljeet S., to Raytheon Company. Cordic apparatus and method for approximating the magnitude and phase of a complex number. 4,945,505, Cl. 364-715.030.
Wienhold, Peter: *See*—
Shmayda, Walter T.; Waelbroeck, Francois; Wienhold, Peter; and Winter, Joerg, 4,944,777, Cl. 55-16.000.
Wiggins Teape Group Limited, The: *See*—
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Wilczak, Wojciech A., to Hoechst Celanese Corporation. 1,4 or 9,10 dimethoxyanthracene triggers for 2-tri(chloro or bromo)methyl-4(1H)-quinazolimone polymerization imitiators. 4,945,027, Cl. 430-281.000.
Wilde, Rene-Holger: *See*—
Langner, Bernd; and Wilde, Rene-Holger, 4,944,935, Cl. 423-604.000.
Wilde, Werner, to Robert Bosch GmbH. Apparatus for varying the position of a control device of an internal combustion engine. 4,944,268, Cl. 123-342.000.
Wildman, John R.: *See*—
Osher, John D.; Katzman, Allison W.; Luecke, Mark; and Wildman, John R., 4,944,363, Cl. 273-58.00A.
Wilens, Seymour: *See*—
Trunk, Edmund G.; and Wilens, Seymour, 4,945,401, Cl. 357-81.000.
Wilhelm, Max: *See*—
Bencze, William; Frostl, Wolfgang; and Wilhelm, Max, 4,945,092, Cl. 514-252.000.
Wilkes, Robert D., to Jacuzzi, Inc. Plastic centrifugal pump. 4,944,653, Cl. 415-174.300.
Wilkus, Edward V.; and Wu, Alexander F. Crosslinked polymer interdispersions, related compositions and method of making same. 4,945,132, Cl. 525-194.000.
Willats, Terence F.: *See*—
Bagshaw, John M.; Kent, Lionel W. J.; Willats, Terence F.; and Payne, Steven J., 4,945,539, Cl. 372-13.000.
Willems, Leonardus F., to U.S. Philips Corporation. Method of and device for deriving formant frequencies using a Split Levinson algorithm. 4,945,568, Cl. 381-50.000.
Willert, Hans-Georg; and Koch, Rudolf, to Sulzer Brothers Limited. Fixing stem for a prosthesis. 4,944,763, Cl. 623-23.000.
Williams, Brian R. Gripping device. 4,944,766, Cl. 623-65.000.
Williams, Jack J.: *See*—
Bartholomew, Alan; and Williams, Jack J., 4,944,323, Cl. 137-227.000.
Williams, Jack R. Dewatering system for sludge removal. 4,944,873, Cl. 210-209.000.
Willingham, Charles B.; and Pappis, James, to Raytheon Company. Polycrystalline zinc sulfide and zinc selenide articles having improved optical quality. 4,944,900, Cl. 264-1.200.
Willis, Anthony J.: *See*—
Wallace, Peter L.; and Willis, Anthony J., 4,944,843, Cl. 162-101.000.
Willis, Timothy G. Intra-oral radiographic film holder. 4,945,553, Cl. 378-168.000.

Wilmer, Richard C.; and Di Bene, Joseph T., to Maxtor Corporation. Magnetic recording head employing an I-bar core structure. 4,945,434, Cl. 360-103.000.

Wilson, James E.: *See—*
Futter, Menachem; Wilson, James E.; and Golden, Annette M., 4,944,625, Cl. 401-153.000.

Wilson, Lance G., to Motorola, Inc. High frequency impedance transformer. 4,945,319, Cl. 333-33.000.

Wilson, Norman H.: *See—*
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Wilson, Thomas N., to Southwire Company. High speed coiling apparatus. 4,944,469, Cl. 242-82.000.

Winfred M. Berg, Inc: *See—*
Berg, Dennis G., 4,944,610, Cl. 384-147.000.

Wink, Joachim: *See—*
Grabley, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, 4,945,108, Cl. 514-475.000.

Winnek, Douglas F. High definition, three-dimensional television. 4,945,407, Cl. 358-88.000.

Winter, Joerg: *See—*
Shmayda, Walter T.; Waelbroeck, Francois; Wienhold, Peter; and Winter, Joerg, 4,944,777, Cl. 55-16.000.

Winteringham, Roy: *See—*
Manzer, Leo E.; Rao, V. N. Mallikarjuna; Rockwell, Richard T.; Sisk, Michael A.; Warwas, Edwin J.; and Winteringham, Roy, 4,944,846, Cl. 203-1.000.

Wist, Abund O.; Pandey, Ramendra N.; and Fatouros, Panos P., to Center for Innovative Technology. Early detection of breast concer using transillumination. 4,945,239, Cl. 250-358.100.

Wittkopf, Eugene W.; and Leansa, Glen B., to Integrated Design Corp. Web tension control system. 4,945,293, Cl. 318-7.000.

Wnuk, Vincent P., to Hitec Products, Inc. Capacitive strain gage having fixed capacitor plates. 4,944,181, Cl. 73-780.000.

Wolf, Edward D.: *See—*
Sanford, John C.; Wolf, Edward D.; and Allen, Nelson K., 4,945,050, Cl. 435-172.100.

Wolf, Klaus-Dieter: *See—*
Gansen, Peter; Wolf, Klaus-Dieter; and Seel, Klaus, 4,945,117, Cl. 521-99.000.

Wolpert, Stephen M.: *See—*
Lindert, Andreas; and Wolpert, Stephen M., 4,944,812, Cl. 148-251.000.

Womack, Robert C. Automobile lock cap clincher. 4,944,177, Cl. 72-410.000.

Wood, Michael A., to Davy McKee (London) Limited. Process for the production of gamma-butyrolactone. 4,945,173, Cl. 549-295.000.

Wood, Theodore N., Jr. Safety cap assembly. 4,944,424, Cl. 220-85.00P.

Woodard, Steven W., to Eaton Corporation. Torsion damping mechanism for a supercharger. 4,944,278, Cl. 123-559.100.

Woodard, Steven W., to Eaton Corporation. Supercharger torsion damping mechanism with friction damping. 4,944,279, Cl. 123-559.100.

Woodward, Daniel A. Tool for uncoupling interlocking blocks. 4,944,061, Cl. 7-170.000.

Woodward, James R.: *See—*
Gole, James L.; Woodward, James R.; and Cobb, Stephen H., 4,945,546, Cl. 372-89.000.

Wooster Brush Company, The: *See—*
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Worner, Gunter; and Tscheplak, Ernst, to Daimler-Benz AG. Split flywheel with vibration compensation between vehicle engine and drive train. 4,944,712, Cl. 464-67.000.

Wrice, Johnnie M.: *See—*
Watts, Marcella; and Wrice, Johnnie M., 4,944,547, Cl. 296-97.800.

Wright, Michael E., to National Semiconductor Corporation. Level and edge sensitive input circuit. 4,945,261, Cl. 307-443.000.

Wroblowsky, Heinz-Jurgen: *See—*
Jensen-Korte, Uta; Gehring, Reinhold; Schallner, Otto; Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Becker, Benedikt; Homeyer, Bernhard; Behrenz, Wolfgang; Stendel, Wilhelm; and Andrews, Peter, 4,945,165, Cl. 548-362.000.

Wrzesinski-Conran, Mary A.: *See—*
Griesbaum, Theodore J.; Lydic-Mettler, Joan S.; Flores, Pamela A.; Jasek, Anthony B.; and Wrzesinski-Conran, Mary A., 4,944,556, Cl. 297-437.000.

Wrzesinski, Stanley, to Motorola, Inc. Short circuit protection arrangement for a driver circuit. 4,945,358, Cl. 361-42.000.

Wu, Alexander F.: *See—*
Wilkus, Edward V.; and Wu, Alexander F., 4,945,132, Cl. 525-194.000.

Wu, Hann-Chang: *See—*
Wu, Jaw-Shyong; Wang, Yun-Terng; Wu, Hann-Chang; and Shieh, Jiin-Tsong, 4,944,106, Cl. 43-15.000.

Wu, Jaw-Shyong; Wang, Yun-Terng; Wu, Hann-Chang; and Shieh, Jiin-Tsong. Fishing hooker or catcher. 4,944,106, Cl. 43-15.000.

Wu, Shui-Kuan, to Fong Yang Plastic Co., Ltd. Pyramid cosmetic container. 4,944,402, Cl. 206-581.000.

Wuensch, Werner: *See—*
Gneiss, Heinz; Kienzle, Wolfgang; Sauer, Rudolf; and Wuensch, Werner, 4,944,182, Cl. 73-204.260.

Wurster, James C.: *See—*
Knutson, Robert D.; Boczkiewicz, Bruce; and Wurster, James C., 4,944,258, Cl. 134-167.00C.

Wymore, Roger S. Fixed and sliding fishing sinkers. 4,944,107, Cl. 43-44.890.

Xecutek Corporation: *See—*
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Xerox Corporation: *See—*
Huang, Tiao-Yuan, 4,945,067, Cl. 437-41.000.
Nielsen, Norman A., 4,944,997, Cl. 428-327.000.

Yabe, Masao; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. Process for the preparation of information recording medium. 4,944,967, Cl. 427-393.500.

Yabuno, Ryohei: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Matsuzaki, Kunio; Ishii, Masami; Yabuno, Ryohei; and Oka, Tetsuo, 4,944,183, Cl. 73-295.000.

Yagi, Hisanori; Hamada, Kousuke; Nakano, Isamu; Nishimura, Yoshihiro; Matsubayashi, Hajime; and Tani, Hisashi, to Kanzaki Paper Manufacturing Company, Limited. Process for electrostatic recording comprising charging dielectric sheet to polarity opposite of imaging charge. 4,944,959, Cl. 427-14.100.

Yagishita, Aisaburo; Iriyama, Yasunori; and Osuga, ouichiro, to Kabushiki Kaisha Yagishita. Automatic filtration dewatering system. 4,944,870, Cl. 210-103.000.

Yagoura, Hideya; and Yamamoto, Isamu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device housing with laser diode and light receiving element. 4,945,391, Cl. 357-19.000.

Yamada, Genjiro: *See—*
Hara, Fumihiko; Hayashi, Shuji; and Yamada, Genjiro, 4,945,295, Cl. 318-490.000.

Yamada, Hideaki; Kimura, Masato; Oka, Masataka; and Saito, Kohta, to Nippon Petrochemical Co., Ltd. Disposable tray for medical use and method of making the same. 4,944,427, Cl. 220-406.000.

Yamada, Kenji, to Fujitsu Limited. High speed stack circuit for register data in a microcomputer. 4,945,469, Cl. 364-200.000.

Yamada, Shiro. Matted (delustered) artificial hair and method of preparation thereof. 4,944,751, Cl. 623-15.000.

Yamada, Syuji; and Andou, Hironori, to Mita Industrial Co., Ltd. Scanning-member-stop positioning device for the image forming apparatus. 4,945,384, Cl. 355-51.000.

Yamada, Yasushi; Maekawa, Yoshikazu; Arai, Hiroyuki; Okui, Susumu; Hirabayashi, Tsugio; and Miura, Toshihide, to Konica Corporation. Document feeding apparatus. 4,944,504, Cl. 271-171.000.

Yamada, Yukio: *See—*
Hasegawa, Hirofumi; Kojima, Hiroaki; Matsuura, Yasuhiro; Ohmori, Naoto; and Yamada, Yukio, 4,945,390, Cl. 355-321.000.

Yamagata, Kiyohiro; Abe, Nobumasa; Toba, Koichi; Kobayashi, Atsushi; and Watanabe, Koji, to Seiko Epson Corporation. Image forming apparatus. 4,945,381, Cl. 355-27.000.

Yamagata, Sen: *See—*
Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, 4,944,746, Cl. 606-195.000.

Yamagiwa, Akira: *See—*
Kato, Tadao; Yamagiwa, Akira; and Matsuoka, Eiichi, 4,944,144, Cl. 57-105.000.

Yamaguchi, Yohichi: *See—*
Nishikawa, Masaru; Nakagawa, Kazumichi; and Yamaguchi, Yohichi, 4,944,837, Cl. 156-646.000.

Yamakido, Kazuo, to Hitachi, Ltd. A/D converter. 4,945,359, Cl. 341-143.000.

Yamakita, Yoshimichi, to Yoshida Kogyo K. K. Dyeing apparatus. 4,944,166, Cl. 68-157.000.

Yamamoto, Isamu: *See—*
Yagoura, Hideya; and Yamamoto, Isamu, 4,945,391, Cl. 357-19.000.

Yamamoto, Katsuharu, to Mitsubishi Denki Kabushiki Kaisha. Air conditioning system into which a refrigerator or a warming cabinet is integrated, and power source circuit therefor. 4,944,156, Cl. 62-324.600.

Yamamoto, Kazuo: *See—*
Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwasa, Kazuyuki; and Nakano, Toshifumi, 4,945,372, Cl. 354-199.000.

Yamamoto, Noboru: *See—*
Kawahara, Eiichiro; Ikejiri, Kenichi; Furumoto, Mitsumasa; and Yamamoto, Noboru, 4,944,154, Cl. 60-488.000.

Yamamoto, Osamu; Yoshida, Toshihiko; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Optical information processing apparatus. 4,945,525, Cl. 369-44.120.

Yamamoto, Saburo: *See—*
Yamamoto, Osamu; Yoshida, Toshihiko; and Yamamoto, Saburo, 4,945,525, Cl. 369-44.120.

Yamamoto, Soichiro, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent and polymerizable compound wherein the silver halide is monodispersed. 4,945,023, Cl. 430-138.000.

Yamamoto, Souichi: *See—*
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Mikasa, Yuko; Shimada, Yuki; Hirashima, Tsuneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,945,021, Cl. 430-76.000.

Yamamoto, Takayuki: *See—*
Sueyoshi, Tadahiro; Yamamoto, Takayuki; and Tsuji, Masanori, 4,944,696, Cl. 439-595.000.

Yamamoto, Takemi; Kawahara, Hiroshi; Matsumoto, Yunio; hayashi, Shigeyuki; Hayakawa, Kiyoharu; Takagi, Osamu; Asano, Yuji; Nakazawa, Takao; and Higashiyama, Shunichi, to Brother Kogyo Kabushiki Kaisha. Pressure developing device. 4,945,374, Cl. 354-304.000.

Yamanaka, Yutaka: *See*—
Ono, Yuzo; Yamanaka, Yutaka; and Kimura, Yasuo, 4,945,529, Cl. 369-109.000.
Yamanashi, Makoto: *See*—
Tsuji, Masanori; Murakami, Yoshihiro; and Yamanashi, Makoto, 4,944,695, Cl. 439-595.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Tanaka, Akihiro; and Sakamoto, Shuichi, 4,945,081, Cl. 514-30.000.
Yamasaki, Hiroyuki: *See*—
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Yamasaki, Hiroyuki; Konishi Yasuhiro; and Ikeda, Yuto, 4,945,517, Cl. 365-189.010.
Yamashita, Syuzo: *See*—
Michizuki, Akira; Sato, Yoshio; Ogawara, Hisashi; and Yamashita, Syuzo, 4,944,881, Cl. 210-640.000.
Yamashita, Takaji; and Uchida, Hiroshi, to Hamamatsu Photonics Kabushiki Kaisha; and Research Development Corporation of Japan. Position-sensitive radiation detector. 4,945,241, Cl. 250-367.000.
Yamauchi, Kazuhisa; Sawada, Kazuo; and Nakai, Yoshihiro, to Sumitomo Electric Industries, Ltd. Apparatus for producing single crystals. 4,944,925, Cl. 422-249.000.
Yamauchi, Ken: *See*—
Hiroki, Keiichiro; Fukasawa, Yukihiko; and Yamauchi, Ken, 4,945,424, Cl. 358-335.000.
Yamauchi, Kiyotaka; and Yoshizawa, Yoshihito, to Hitachi Metals, Ltd. Anti-theft sensor marker. 4,945,339, Cl. 340-551.000.
Yamazaki, Shunpei: *See*—
Fukuda, Takeshi; Amachi, Nobumitsu; Sakama, Mitsunori; Sakamoto, Naoya; and Yamazaki, Shunpei, 4,945,226, Cl. 250-214.00R.
Yamazaki, Yasuo: *See*—
Higuchi, Tatsuji; Yamamoto, Kazuo; Shirai, Hitoshi; Yamazaki, Yasuo; Torikoshi, Yuichi; Iwasa, Kazuyuki; and Nakano, Toshifumi, 4,945,372, Cl. 354-199.000.
Yamazaki, Youichi: *See*—
Kimura, Toshiyuki; Yamazaki, Youichi; Nonaka, Yoshiya; Go, Yasunao; Endo, Fumio; Komata, Hiroyuki; and Syoji, Mitsuo, 4,945,335, Cl. 340-426.000.
Yanagawa, Motoo, to Research Development Corporation of Japan. Electrostatic dust collector. 4,944,778, Cl. 55-131.000.
Yanai, Akira; and Ueda, Yoshizumi. Plasmid with wide host range and process of producing L. threonine using the same. 4,945,058, Cl. 435-252.300.
Yanai, Toshiaki: *See*—
Sato, Kazuo; Yanai, Toshiaki; Kitano, Noritoshi; Nishida, Akira; Frei, Bruno; and O'Sullivan, Anthony, 4,945,105, Cl. 514-450.000.
Yasuda, Kenji; Kobayashi, Akira; Tokita, Makiko; Maekawa, Masao; Kitajima, Masahiko; and Maruyama, Hisao, to OJI Paper Co., Ltd. Ink jet recording sheet and process for producing same. 4,944,988, Cl. 428-195.000.
Yasue, Takao: *See*—
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,945,235, Cl. 250-306.000.
Yavrouian, Andre H.: *See*—
Gupta, Amitava; Liang, Ranty H.; and Yavrouian, Andre H., 4,945,001, Cl. 428-412.000.
Yazaki Corporation: *See*—
Horibe, Kinya; and Fujimaki, Hirohiko, 4,944,084, Cl. 29-623.000.
Oikawa, Ryuetsu; and Ikari, Akira, 4,945,193, Cl. 174-153.00G.
Ono, Mamoru; Kudo, Ichiro; and Okazaki, Toshio, 4,944,475, Cl. 248-71.000.
Sueyoshi, Tadahiro; Yamamoto, Takayuki; and Tsuji, Masanori, 4,944,696, Cl. 439-595.000.
Tsuji, Masanori; Murakami, Yoshihiro; and Yamanashi, Makoto, 4,944,695, Cl. 439-595.000.
Yazdani, Armand; and Anidjar, Morris, to Nei Canada Limited. Cool light source for optic fibres. 4,945,457, Cl. 362-101.000.
Yokoya, Noboru; and Tabata, Hajime, to Honda Giken Kogyo Kabushiki Kaisha. Supporting device for generator on engine. 4,945,271, Cl. 310-91.000.
Yonekawa, Yasuhiro: *See*—
Iwata, Hiroo; Yamagata, Sen; Taki, Waro; Matsuda, Takehisa; Kikuchi, Haruhiko; Yonekawa, Yasuhiro; and Goto, Yasuhiro, 4,944,746, Cl. 606-195.000.
Yoneshige, Yasuo; Misumi, Atsushi; Hiromoto, Shuji; and Sakai, Toru, to NHK Spring Co., Ltd. Cushion. 4,944,992, Cl. 428-198.000.
Yoon, Hyun-Nam: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,944,896, Cl. 252-587.000.
Yoshida, Ikuo: *See*—
Uchihori, Yuji; Sekitani, Yasushi; and Yoshida, Ikuo, 4,945,048, Cl. 435-105.000.
Yoshida Kogyo K. K.: *See*—
Yamakita, Yoshimichi, 4,944,166, Cl. 68-157.000.
Yoshida, Motoaki: *See*—
Maeda, Koichi; Takigawa, Akio; Tago, Yasuyoshi; and Yoshida, Motoaki, 4,944,584, Cl. 351-172.000.
Yoshida, Tetsushi; and Kozima, Ken, to Casio Computer Co., Ltd. Liquid crystal display device. 4,944,577, Cl. 350-346.000.
Yoshida, Toshihiko: *See*—
Yamamoto, Osamu; Yoshida, Toshihiko; and Yamamoto, Saburo, 4,945,525, Cl. 369-44.120.
Yoshida, Toyohiko: *See*—
Itomitsu, Fujio; and Yoshida, Toyohiko, 4,945,511, Cl. 364-900.000.
Yoshida, Yasuhiro: *See*—
Ochi, Daisuke; Yoshida, Yasuhiro; and Iwaki, Yoshiyuki, 4,945,272, Cl. 310-91.000.
Yoshihara, Kunio: *See*—
Suzuki, Koji; Nagahira, George; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,945,255, Cl. 307-17.000.
Yoshikawa, Tuguo: *See*—
Suzuki, Yasuhiro; Yoshikawa, Tuguo; Shibata, Kazuhiro; Fukui, Akio; and Shiga, Kiyotaka, 4,944,640, Cl. 408-211.000.
Yoshimura, Hiroshi, to Hakko Metal Industries Limited. Card controlled soldering iron temperature control device. 4,945,210, Cl. 219-241.000.
Yoshimura, Koji: *See*—
Kikuchi, Masakazu; Yoshimura, Koji; and Nakahama, Kazuo, 4,945,051, Cl. 435-172.300.
Yoshizawa, Yoshihito: *See*—
Yamauchi, Kiyotaka; and Yoshizawa, Yoshihito, 4,945,339, Cl. 340-551.000.
Young, Clinton J. T. Variable aspect display. 4,944,572, Cl. 350-167.000.
Young, Donald C., to Union Oil Company of California. Thermally stable urea-sulfuric acid compositions and methods of manufacture. 4,944,787, Cl. 71-28.000.
Young, John A.: *See*—
Mason, Charles D.; Young, John A.; Haylock, John C.; and Twilley, Ian C., 4,945,129, Cl. 525-66.000.
Yui, Hiroshi: *See*—
Miyabayashi, Mitsutaka; Nishii, Toshifumi; Yui, Hiroshi; Inada, Kuniaki; Ikeda, Katsuji; Nose, Hiroyoshi; and Tsuchiya, Kenji, 4,945,014, Cl. 429-218.000.
Yui, Yasuji; Hitachi, Akio; Sato, Tatsuru; and Shirakura, Akira, to Sony Corporation. A printer for printing a certain image on a sheet of developing paper. 4,945,382, Cl. 355-27.000.
Yura, Haruhiko: *See*—
Sato, Tutomu; Yura, Haruhiko; Nasu, Yoshihiko; Fujiwara, Atsumi; and Mori, Shigeo, 4,945,317, Cl. 330-301.000.
Yurchenco, James R.; and Duval, Eugene F., to NeXT, Inc. Balanced monitor stand. 4,944,481, Cl. 248-372.100.
Yurgevich, Howard J., to Rosby Corporation. Angle reinforcement. 4,944,421, Cl. 220-1.500.
Zachariades, Anagnostis E. Composite structures of ultra-high-molecular-weight polymers, such as ultra-high-molecular-weight polyethylene products, and method of producing such structures. 4,944,974, Cl. 428-36.100.
Zagrodnik, Jeffrey P.: *See*—
Bowen, Gerald K.; and Zagrodnik, Jeffrey P., 4,945,019, Cl. 429-72.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Christian, Klaus, 4,944,378, Cl. 192-107.00M.
Gierer, Georg, 4,944,202, Cl. 74-869.000.
Zakai, Avi, to Dan Mamtirim. Rotary sprinkler. 4,944,456, Cl. 239-222.190.
Zakich, Paul, to Dow Chemical Company, The. High tonnage rim press. 4,944,669, Cl. 425-589.000.
Zamzow, Charles E.: *See*—
Carver, Larry L.; Zamzow, Charles E.; Mladenoff, Donald D.; and Lovrien, Glenn A., 4,945,488, Cl. 364-474.240.
Zancaner, Alberto. Device for supporting spectacles frames. 4,944,582, Cl. 351-41.000.
Zank, Gregg A.: *See*—
Burns, Gary T.; and Zank, Gregg A., 4,945,072, Cl. 501-88.000.
Zarotti, Claudio, to VELA S.r.l. Padding element for protection against shocks, particularly for a crash helmet. 4,944,044, Cl. 2-413.000.
Zavracky, Paul M.: *See*—
Allen, Lisa P.; Vu, Duy-Phach; Batty, Michael W.; Morrision, Richard H., Jr.; and Zavracky, Paul M., 4,944,835, Cl. 156-620.700.
ZED Instruments Ltd.: *See*—
Zollman, Peter M.; Pollard, Brendon T.; and Birch, Andrew D., 4,944,826, Cl. 156-345.000.
Zedrosser, Ulrich, to Steyr-Daimler-Puch AG. Rifle. 4,944,109, Cl. 42-71.010.
Zeeck, Axel: *See*—
Grabley, Susanne; Wink, Joachim; Giani, Carlo; Seibert, Gerhard; Raether, Wolfgang; Dobreff, Susanne; and Zeeck, Axel, 4,945,108, Cl. 514-475.000.
Zehnal, Sally A., to Uncle Ben's Inc. Carton with pour spout. 4,944,406, Cl. 206-621.400.
Zelenka, Jerry L. Solder dispensing apparatus and method of operation. 4,944,464, Cl. 242-54.00R.
Zentner, John R. Ball batting game apparatus. 4,944,513, Cl. 273-26.00R.
Zeuner, Siegfried: *See*—
Nilsson, Karl E.; and Zeuner, Siegfried, 4,944,528, Cl. 280-741.000.
Ziesel, Lawrence B.: *See*—
Credle, William S., Jr.; Ziesel, Lawrence B.; and Heflin, Mark S., 4,944,337, Cl. 141-174.000.
Ziggity Systems, Inc.: *See*—
Hostetler, Eldon, 4,944,484, Cl. 251-101.000.
Zilley, Eric L.: *See*—
Muggee, John M.; and Zilley, Eric L., 4,945,006, Cl. 428-500.000.
Zimmer, Ernst, to Kuka Schweissanlagen & Roboter GmbH. Method for automatic joining and machining. 4,944,445, Cl. 228-102.000.

Zimmer, James M.; and Bailey, William D., to Ipsco Enterprises, Inc. Aluminum-manganese-iron steel alloy. 4,944,814, Cl. 148-329.000.

Zippertubing Co., The: *See*—
Plummer, Walter A., III, 4,944,976, Cl. 428-36.900.

Zipplies, Matthias; Sauter, Hubert; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. Guanidinium compounds and fungicides containing them. 4,945,112, Cl. 514-555.000.

Zodrow, Rudolf; Rogall, Wolfgang; Hoveler, Egon; and Buchholz, Rainer, to Holstein und Kappert AG. Machine for labelling bottles. 4,944,830, Cl. 156-567.000.

Zoeller, Joseph R.: *See*—
Cushman, Michael R.; Nicely, Vincent A.; Tennant, Brent A.; and Zoeller, Joseph R., 4,945,075, Cl. 502-24.000.

Zollman, Peter M.; Pollard, Brendon T.; and Birch, Andrew D., to ZED Instruments Ltd. Method and apparatus for preparing a screen printing screen. 4,944,826, Cl. 156-345.000.

Zondler, Helmut: *See*—
Nyfeler, Robert; Zondler, Helmut; and Sturm, Elmar, 4,945,100, Cl. 514-383.000.

Zschocher, Hartmut: *See*—
Sorg, Helmut; Pieper, Helmut; Zschocher, Hartmut; and Merlet, Heinz, 4,944,785, Cl. 65-136.000.

Zuel Company: *See*—
Zuel, David C., 4,944,986, Cl. 428-156.000.

Zuel, David C., to Zuel Company. Anti-reflective glass surface. 4,944,986, Cl. 428-156.000.

Zuk, Robert: *See*—
Litman, David; Zuk, Robert; and Rowley, Gerald, 4,945,205, Cl. 219-121.720.

Zushi, Mamoru: *See*—
Sakamoto, Yukio; Zushi, Mamoru; and Bando, Masahiro, 4,945,332, Cl. 336-69.000.

Zwambag, Henry: *See*—
Brouwer, Gerardus J.; and Zwambag, Henry, 4,944,352, Cl. 172-19.000.

501 Patrucco Due Co. S.R.L., S.N.: *See*—
Patrucco, Sergio, 4,944,115, Cl. 47-7.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anami, Kenji: *See*—
Yoshimoto, Masahiko; Yoshihara, Tsutomu; Anami, Kenji; and Shinohara, Hirofumi, Re. 33,280, Cl. 365-189.010.

BIC Corporation: *See*—
Schachter, Friedrich, Re. 33,282, Cl. 431-344.000.

Communications Technology Corporation: *See*—
Ray, Jimmy C.; and Matthews, H. Wayne, Re. 33,281, Cl. 379-25.000.

General Electric Company: *See*—
Wehrli, Felix W., Re. 33,279, Cl. 324-309.000.

Hollingsead International, Inc.: *See*—
Hollingsead, Robert A.; and Pryor, Clyde R., Re. 33,283, Cl. 439-296.000.

Hollingsead, Robert A.; and Pryor, Clyde R., to Hollingsead International, Inc. Pivotable extractor hold down apparatus. Re. 33,283, Cl. 439-296.000.

Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; Ohba, Hitoshi; and Watase, Masahiko, to Shin-Etsu Chemical Co., Ltd. Method for the polymerization of vinyl chloride monomer in an aqeous medium. Re. 33,284, Cl. 526-74.000.

Johnshoy, Edward W. Continuously variable transmission and torque retaining differential. Re. 33,278, Cl. 475-6.000.

Kunen, Scott M. Touch controlled switch for a lamp or the like. Re. 33,285, Cl. 307-116.000.

Matthews, H. Wayne: *See*—
Ray, Jimmy C.; and Matthews, H. Wayne, Re. 33,281, Cl. 379-25.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Yoshimoto, Masahiko; Yoshihara, Tsutomu; Anami, Kenji; and Shinohara, Hirofumi, Re. 33,280, Cl. 365-189.010.

Noguki, Genji: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; Ohba, Hitoshi; and Watase, Masahiko, Re. 33,284, Cl. 526-74.000.

Ohba, Hitoshi: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; Ohba, Hitoshi; and Watase, Masahiko, Re. 33,284, Cl. 526-74.000.

Pryor, Clyde R.: *See*—
Hollingsead, Robert A.; and Pryor, Clyde R., Re. 33,283, Cl. 439-296.000.

Ray, Jimmy C.; and Matthews, H. Wayne, to Communications Technology Corporation. Cable analyzer with d.c. functions. Re. 33,281, Cl. 379-25.000.

Schachter, Friedrich, to BIC Corporation. Liquid gas-operated lighter. Re. 33,282, Cl. 431-344.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; Ohba, Hitoshi; and Watase, Masahiko, Re. 33,284, Cl. 526-74.000.

Shinohara, Hirofumi: *See*—
Yoshimoto, Masahiko; Yoshihara, Tsutomu; Anami, Kenji; and Shinohara, Hirofumi, Re. 33,280, Cl. 365-189.010.

Tanaka, Motoaki: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; Ohba, Hitoshi; and Watase, Masahiko, Re. 33,284, Cl. 526-74.000.

Watase, Masahiko: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; Ohba, Hitoshi; and Watase, Masahiko, Re. 33,284, Cl. 526-74.000.

Wehrli, Felix W., to General Electric Company. Method for rapid acquisition of NMR data. Re. 33,279, Cl. 324-309.000.

Yoshihara, Tsutomu: *See*—
Yoshimoto, Masahiko; Yoshihara, Tsutomu; Anami, Kenji; and Shinohara, Hirofumi, Re. 33,280, Cl. 365-189.010.

Yoshimoto, Masahiko; Yoshihara, Tsutomu; Anami, Kenji; and Shinohara, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device. Re. 33,280, Cl. 365-189.010.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Abbott Laboratories: *See*—
Shaffar, Mark R., B1 4,495,293, Cl. 436-172.000.

Davis, Stephen P.: *See*—
Palluel, August L. L.; Davis, Stephen P.; and Fletcher, Angela C., B1 4,785,035, Cl. 524-101.000.

Fletcher, Angela C.: *See*—
Palluel, August L. L.; Davis, Stephen P.; and Fletcher, Angela C., B1 4,785,035, Cl. 524-101.000.

Imperial Chemical Industries PLC: *See*—
Palluel, August L. L.; Davis, Stephen P.; and Fletcher, Angela C., B1 4,785,035, Cl. 524-101.000.

Palluel, August L. L.; Davis, Stephen P.; and Fletcher, Angela C., to Imperial Chemical Industries PLC. Curing composition. B1 4,785,035, 7-31-90, Cl. 524-101.000.

Shaffar, Mark R., to Abbott Laboratories. Fluorometric assay. B1 4,495,293, 7-31-90, Cl. 436-172.000.

LIST OF DESIGN PATENTEES

Abriam, Olive. Post-surgery pillow. 309,544, 7-31-90, Cl. D6-601.000.

Aloys F. Dornbracht GmbH & Co.: *See*—
Reinecke, Herbert, 309,655, Cl. D23-238.000.

Anchor Hocking Corporation: *See*—
Meisner, Edward, 309,554, Cl. D7-602.000.

Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 309,545, Cl. D7-507.000.

Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Combined tray, mugs and coffee service. 309,545, 7-31-90, Cl. D7-507.000.

Anderson, Sheldon J.; and Schleweis, Kevin M. Novelty table ornament. 309,588, 7-31-90, Cl. D11-158.000.

Aoki, Sanae; and Konoike, Tsunataka, to Tanaka Manufacturing Company Limited. Compass. 309,580, 7-31-90, Cl. D10-68.000.

Aoyama, Minoru: *See*—
Komada, Takeshi; Aoyama, Minoru; Hirata, Tomohiko; and Sakurai, Mitsuru, 309,632, Cl. D18-42.000.

Arai, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Automobile bumper. 309,594, 7-31-90, Cl. D12-169.000.

Archer, Howard E. Golf swing guide club. 309,649, 7-31-90, Cl. D21-214.000.

Arnatt, Ray E. Beverage can holder for a refrigerator. 309,615, 7-31-90, Cl. D15-89.000.

Astle, William H., to Tri Tool Inc. Tube cutter. 309,563, 7-31-90, Cl. D8-60.000.

AT&T Company: *See*—
Fortune, Duane D.; Joffe, Richard M.; Mack, Henry J., Jr.; McGarvey, John N.; and Zambelli, Michael P., 309,605, Cl. D14-140.000.

Atsuumi, Masaru: *See*—
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 309,597, Cl. D13-116.000.

Autopart Sweden Aktiebolag: *See*—
Jonäs, Mats, 309,595, Cl. D12-191.000.

Ayyoubi, Luay; and Evans, Travis O. Reclosable funnel fixture. 309,558, 7-31-90, Cl. D7-700.000.

Backes, James J., to Square D Company. Programmable logic controller. 309,600, 7-31-90, Cl. D13-162.000.

Bailey, Thomas D. Gameboard. 309,636, 7-31-90, Cl. D21-31.000.

Bailey, Wayne E. Telescoping automobile door guard. 309,593, 7-31-90, Cl. D12-167.000.

Bain, Charles E., to Bell & Howell Company. Machine for inserting paper sheets into envelopes. 309,617, 7-31-90, Cl. D15-199.000.

Bandal Enterprises, Inc.: *See*—
Kim, Chan Y., 309,529, Cl. D4-116.000.

Barner, Terry L.: *See*—
Sereika, Joseph C.; Barner, Terry L.; and Perelli, Thomas, 309,629, Cl. D18-11.000.

Baron, William; and Humphrey, Neall, to Trade Source International. Novelty witch stick. 309,648, 7-31-90, Cl. D21-190.000.

Bell & Howell Company: *See*—
Bain, Charles E., 309,617, Cl. D15-199.000.

Bergeson, Donna. Napkin arranger. 309,556, 7-31-90, Cl. D7-633.000.

Bergman, Nils-Ake: *See*—
Widell, Harald; Widell, Jan; and Bergman, Nils-Ake, 309,599, Cl. D13-133.000.

Beton, Jean C., to Forbees-Compagnie Generale de Participation. Perfume bottle. 309,568, 7-31-90, Cl. D9-410.000.

Black & Decker Inc.: *See*—
McCloskey, Don R., 309,548, Cl. D7-378.000.

Boiocchi, Maurizio: *See*—
Guermandi, Romano; and Boiocchi, Maurizio, 309,591, Cl. D12-147.000.

Boscacci, William L.; and O'Neill, Edward L., to Lucasey Manufacturing Corporation. Adjustable ceiling-mounted appliance support. 309,562, 7-31-90, Cl. D8-373.000.

Boyden, Michael: *See*—
Hare, Glenn F.; and Boyden, Michael, 309,589, Cl. D12-128.000.

Brainard, Robert H.: *See*—
Milecs, George; and Brainard, Robert H., 309,566, Cl. D9-306.000.

Bunn-O-Matic Corporation: *See*—
Van Camp, Raymond E., 309,546, Cl. D7-308.000.

Burton, Thomas D., to General Electric Company. Electronic circuit breaker programmer tester. 309,581, 7-31-90, Cl. D10-78.000.

Canon Kabushiki Kaisha: *See*—
Komada, Takeshi; Aoyama, Minoru; Hirata, Tomohiko; and Sakurai, Mitsuru, 309,632, Cl. D18-42.000.

Carter, Joseph F.; Stewart, John F.; and Maass, James A., to Cooper Industries, Inc. Nose piece for a peck drill. 309,616, 7-31-90, Cl. D15-138.000.

Casio Computer Co., Ltd.: *See*—
Takeichi, Takashi, 309,577, Cl. D10-39.000.

Castagna, William D. Watercraft. 309,596, 7-31-90, Cl. D12-300.000.

Chaikin, Peretz, to Microvue Products. Microfilm reader. 309,621, 7-31-90, Cl. D16-225.000.

Chalberg, Philip E.; and Kawato, Katsumi, to Martech Enterprises, Inc. Dispenser for lawn care chemicals or the like. 309,652, 7-31-90, Cl. D23-207.000.

Christian Dior S.A.: *See*—
Saurer, Hans, 309,576, Cl. D10-39.000.

Chromcraft Furniture Corp.: *See*—
Wilson, Robert L., 309,535, Cl. D6-372.000.

Chu, William H. K. Calculator. 309,627, 7-31-90, Cl. D18-7.000.

Claber S.p.A.: *See*—
Roman, Gianfranco, 309,654, Cl. D23-226.000.

CMB Packaging (UK) Limited: *See*—
Rayner, Adrien P., 309,564, Cl. D9-435.000.

CoBatCo., Inc.: *See*—
Stephens, Donald O., 309,549, Cl. D7-410.000.

Collins, Peter M., to Illinois Tool Works, Inc. Electrical wiring harness retainer. 309,561, 7-31-90, Cl. D8-356.000.

Conti, Rino: *See*—
Picozza, Augusto A.; Freese, Lawrence O.; and Conti, Rino, 309,643, Cl. D21-128.000.

Cooper Industries, Inc.: *See*—
Carter, Joseph F.; Stewart, John F.; and Maass, James A., 309,616, Cl. D15-138.000.

Cross, Gregory L., to Sun Company, Inc. Thermometer. 309,579, 7-31-90, Cl. D10-58.000.

Daenen, Robert H. C. M.; and DeCoster, Pieter J. K., to Dart Industries Inc. Condiment shaker or the like. 309,553, 7-31-90, Cl. D7-591.000.

Daiwa Seiko, Inc.: *See*—
Kameda, Yasuhisa; and Yoshikawa, Toshiaki, 309,650, Cl. D22-141.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and DeCoster, Pieter J. K., 309,553, Cl. D7-591.000.
Picozza, Augusto A.; Freese, Lawrence O.; and Conti, Rino, 309,643, Cl. D21-128.000.

DeCoster, Pieter J. K.: *See*—
Daenen, Robert H. C. M.; and DeCoster, Pieter J. K., 309,553, Cl. D7-591.000.

Desgrippes, Joel, to Hanorah Italiana S.p.A. Perfume bottle with closure. 309,567, 7-31-90, Cl. D9-384.000.

De Vries, Dale; and De Vries, Dean. Plant hanger. 309,541, 7-31-90, Cl. D6-513.000.

De Vries, Dean: *See*—
De Vries, Dale; and De Vries, Dean, 309,541, Cl. D6-513.000.

Dewees, John G.: *See*—
Prendergast, William; and Dewees, John G., 309,538, Cl. D6-455.000.

Display Producers, Inc.: *See*—
Landi, Arthur E., 309,537, Cl. D6-461.000.

Dozsa-Farkas, Andras, to Giroflex Entwicklungs AG. Chair. 309,531, 7-31-90, Cl. D6-366.000.

Dozsa-Farkas, Andras, to Giroflex Entwicklungs AG. Chair. 309,532, 7-31-90, Cl. D6-366.000.

Dozsa-Farkas, Andras, to Giroflex Entwicklungs AG. Chair. 309,533, 7-31-90, Cl. D6-366.000.

Dozsa-Farkas, Andras, to Giroflex Entwicklungs AG. Chair. 309,534, 7-31-90, Cl. D6-366.000.

Eastman Kodak Company: *See*—
Wingate, Barry; and Esslinger, Hartmut H., 309,620, Cl. D16-209.000.

Egly, Robert A.; and Sullivan, Patrick. Disc storage rack. 309,524, 7-31-90, Cl. D3-35.000.

Electrix, Inc.: *See*—
Shwisha, Haim, 309,661, Cl. D26-51.000.

Esslinger, Hartmut H.: *See*—
Wingate, Barry; and Esslinger, Hartmut H., 309,620, Cl. D16-209.000.

Etablissments Jean PERNOT et Cie: *See*—
Quennessen, Michel, 309,557, Cl. D7-693.000.

Eureka, John; Law, Linda K.; and Marsh, David C., to Stouffer Corporation, The. Ravioli. 309,521, 7-31-90, Cl. D1-126.000.

Evans, Tony. Eyeglasses. 309,618, 7-31-90, Cl. D16-102.000.

Evans, Travis O.: *See*—
Ayyoubi, Luay; and Evans, Travis O., 309,558, Cl. D7-700.000.

Ever Sparkle Indusrial Co. Lts.: *See*—
Kuen, Ho T., 309,645, Cl. D21-142.000.

Forbees-Compagnie Generale de Participation: *See*—
Beton, Jean C., 309,568, Cl. D9-410.000.

Fortune, Duane D.; Joffe, Richard M.; Mack, Henry J., Jr.; McGarvey, John N.; and Zambelli, Michael P., to AT&T Company. Controller housing with extender. 309,605, 7-31-90, Cl. D14-140.000.

Foy, Richard; Ruzicka, Thomas; Shelton, David A.; and Tweed, David M., to U.S. West Inc. Font of type or the like. 309,630, 7-31-90, Cl. D18-24.000.

Fratelli Guzzini S.p.A.: *See*—
Pozzi, Ambrogio, 309,550, Cl. D7-505.000.

Freese, Lawrence O.: *See*—
Picozza, Augusto A.; Freese, Lawrence O.; and Conti, Rino, 309,643, Cl. D21-128.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 309,597, Cl. D13-116.000.

Fukuda, Kouki: *See*—
Mizusugi, Kanji; Shiozawa, Hajime; Fukuda, Kouki; and Mano, Yasuhiko, 309,603, Cl. D14-106.000.

General Electric Company: *See*—
Burton, Thomas D., 309,581, Cl. D10-78.000.

Gilbert, Jerry F. Road planer. 309,613, 7-31-90, Cl. D15-23.000.

Gingras, Eric, to Rubbermaid Commercial Products Inc. Brush handle. 309,530, 7-31-90, Cl. D4-138.000.

Giroflex Entwicklungs AG: *See*—
Dozsa-Farkas, Andras, 309,531, Cl. D6-366.000.
Dozsa-Farkas, Andras, 309,532, Cl. D6-366.000.
Dozsa-Farkas, Andras, 309,533, Cl. D6-366.000.
Dozsa-Farkas, Andras, 309,534, Cl. D6-366.000.

Glenn, Gwendolyn. Inflated face-down pillow for a woman. 309,542, 7-31-90, Cl. D6-596.000.

Gold Star Co., Ltd.: *See*—
Lee, Jae W., 309,656, Cl. D23-356.000.

Goodman, Larrison C. Foamed core for a pillow. 309,543, 7-31-90, Cl. D6-601.000.

Gorton, Lanny A., to Pacesetter Infustion, Ltd. Medication infusion pump. 309,662, 7-31-90, Cl. D24-51.000.

Grazi, Victor J. Package. 309,569, 7-31-90, Cl. D9-415.000.

Grossiord, Claude, to S. T. Dupont. Key-ring. 309,525, 7-31-90, Cl. D3-61.000.

Guermandi, Romano; and Boiocchi, Maurizio, to Pirelli Coordinamento Pneumatici S.p.A. Vehicle tire. 309,591, 7-31-90, Cl. D12-147.000.

Halbert, Linda D. Toy road board. 309,646, 7-31-90, Cl. D21-143.000.

Hanh, Lyle D.: *See*—
McDaniel, Alvin R.; Wood, Edgar B.; Hanh, Lyle D.; and Milton, Ted L., 309,634, Cl. D20-7.000.

Hanorah Italiana S.p.A.: *See*—
Desgrippes, Joel, 309,567, Cl. D9-384.000.

Harada, Mieko: *See*—
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Harada, Mieko, 309,624, Cl. D18-7.000.

Hare, Glenn F.; and Boyden, Michael. Folding pole stretcher. 309,589, 7-31-90, Cl. D12-128.000.

Hashiba, Takeo; and Sakamoto, Harumi, to Sharp Corporation. Television set. 309,608, 7-31-90, Cl. D14-126.000.

Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, to Fuji Jukogyo Kabushiki Kaisha. Engine generator. 309,597, 7-31-90, Cl. D13-116.000.

Hilems, Robert P., to Sterling Products. Menu sign. 309,635, 7-31-90, Cl. D20-42.000.
Hino, Shinsaku: *See—*
Osaka, Kazumi; Hino, Shinsaku; and Wada, Tatsumi, 309,604, Cl. D14-109.000.
Hirata, Tomohiko: *See—*
Komada, Takeshi; Aoyama, Minoru; Hirata, Tomohiko; and Sakurai, Mitsuru, 309,632, Cl. D18-42.000.
Hirota, Kimio, to Seikosha Co., Ltd. Travel alarm clock. 309,573, 7-31-90, Cl. D10-18.000.
Hoffman, Ronald J.: *See—*
Kelly, Gordon D.; and Hoffman, Ronald J., 309,606, Cl. D15-1.000.
Hofmann, Gary L. Key ring. 309,526, 7-31-90, Cl. D3-61.000.
Homac Mfg. Company: *See—*
McGrane, Eugene W., 309,664, Cl. D13-146.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Arai, Tomoyuki, 309,594, Cl. D12-169.000.
Hosaka, Norio, to Sony Corporation. Combined tape player, television sound and radio tuner. 309,610, 7-31-90, Cl. D14-163.000.
Howard, William H.: *See—*
Orlick, Jonathan B.; and Howard, William H., 309,644, Cl. D22-134.000.
Huisman, Reinder: *See—*
Thomassen, Charles; Kingma, Klaas; and Huisman, Reinder, 309,520, Cl. D1-121.000.
Humphrey, Neall: *See—*
Baron, William; and Humphrey, Neall, 309,648, Cl. D21-190.000.
Iida, Katsuhiro: *See—*
Sawada, Masaji; Iida, Katsuhiro; and Takahashi, Toshiya, 309,623, Cl. D18-7.000.
Sawada, Masaji; Sakaguchi, Hiroshi; and Iida, Katsuhiro, 309,628, Cl. D18-11.000.
Illinois Tool Works, Inc.: *See—*
Collins, Peter M., 309,561, Cl. D8-356.000.
Innovative Design & Marketing, Inc.: *See—*
McDaniel, Alvin R.; Wood, Edgar B.; Hanh, Lyle D.; and Milton, Ted L., 309,634, Cl. D20-7.000.
Interlego A.G.: *See—*
Knudsen, Jens N., 309,639, Cl. D21-108.000.
Knudsen, Jens N., 309,640, Cl. D21-108.000.
Olsen, Flemming H., 309,641, Cl. D21-109.000.
Ito, Hisayoshi: *See—*
Ohsawa, Osamu; Nagahashi, Takichi; Ito, Tatsuo; Ito, Hisayoshi; and Kondo, Nobuyuki, 309,598, Cl. D13-162.000.
Ito, Tatsuo: *See—*
Ohsawa, Osamu; Nagahashi, Takichi; Ito, Tatsuo; Ito, Hisayoshi; and Kondo, Nobuyuki, 309,598, Cl. D13-162.000.
Itoh, Kunio, to Pentel Kabushiki Kaisha. Ball-point pen or similar article. 309,633, 7-31-90, Cl. D19-51.000.
Itoh, Yukinori: *See—*
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 309,597, Cl. D13-116.000.
Joffe, Richard M.: *See—*
Fortune, Duane D.; Joffe, Richard M.; Mack, Henry J., Jr.; McGarvey, John N.; and Zambelli, Michael P., 309,605, Cl. D14-140.000.
Jonsås, Mats, to Autopart Sweden Aktiebolag. Sun visor with a pocket for an automobile. 309,595, 7-31-90, Cl. D12-191.000.
Kabushiki Kaisha Sun Arrow, a Japanese Corporation: *See—*
Sekiguchi, Yoshihiro, 309,647, Cl. D21-156.000.
Kalbach, Edward V. L. Retainer for eyeglasses. 309,619, 7-31-90, Cl. D16-129.000.
Kameda, Yasuhisa; and Yoshikawa, Toshiaki, to Daiwa Seiko, Inc. Fishing reel body. 309,650, 7-31-90, Cl. D22-141.000.
Kane, James R., to NutraCare International. Food warmer. 309,547, 7-31-90, Cl. D7-323.000.
Kawato, Katsumi: *See—*
Chalberg, Philip E.; and Kawato, Katsumi, 309,652, Cl. D23-207.000.
Kelly, Gordon D.; and Hoffman, Ronald J., to Kohler Co. Engine. 309,606, 7-31-90, Cl. D15-1.000.
Kendrick, Virgil P. Chemical dispenser. 309,653, 7-31-90, Cl. D23-213.000.
Kim, Chan Y., to Bandal Enterprises, Inc. Combined hairbrush and spray dispenser. 309,529, 7-31-90, Cl. D4-116.000.
Kime, James W. Portable cooler. 309,555, 7-31-90, Cl. D7-605.000.
Kingma, Klaas: *See—*
Thomassen, Charles; Kingma, Klaas; and Huisman, Reinder, 309,520, Cl. D1-121.000.
Kinoshita, Masayuki, to Sony Corporation. Case for a video tape cassette. 309,570, 7-31-90, Cl. D9-418.000.
Knudsen, Jens N., to Interlego A.G. Toy palm tree. 309,639, 7-31-90, Cl. D21-108.000.
Knudsen, Jens N., to Interlego A.G. Toy palm leaf construction element. 309,640, 7-31-90, Cl. D21-108.000.
Kohler Co.: *See—*
Kelly, Gordon D.; and Hoffman, Ronald J., 309,606, Cl. D15-1.000.
Komada, Takeshi; Aoyama, Minoru; Hirata, Tomohiko; and Sakurai, Mitsuru, to Canon Kabushiki Kaisha. Sorter for copier. 309,632, 7-31-90, Cl. D18-42.000.
Kondo, Nobuyuki: *See—*
Ohsawa, Osamu; Nagahashi, Takichi; Ito, Tatsuo; Ito, Hisayoshi; and Kondo, Nobuyuki, 309,598, Cl. D13-162.000.
Konoike, Tsunataka: *See—*
Aoki, Sanae; and Konoike, Tsunataka, 309,580, Cl. D10-68.000.
Koyama, Keiichi: *See—*
Sakaguchi, Hiroshi; and Koyama, Keiichi, 309,626, Cl. D18-7.000.
Kraft General Foods, Inc.: *See—*
Mileos, George; and Brainard, Robert H., 309,566, Cl. D9-306.000.
Krishnamurthy, Jagadisan; and Vogt, Noland E., to Semi-jGas Systems, Inc. Portable control housing for gas purging system. 309,584, 7-31-90, Cl. D10-81.000.
Kubota Ltd.: *See—*
Nakagawa, Teruo, 309,612, Cl. D15-1.000.
Yamada, Kiichiro, 309,611, Cl. D15-1.000.
Kuen, Ho T., to Ever Sparkle Industrial Co. Lts. Toy motorcycle. 309,645, 7-31-90, Cl. D21-142.000.
Kulp, Jack H., to Traffix Devices, Inc. Two piece breakaway traffic channelizer. 309,585, 7-31-90, Cl. D10-113.000.
Landi, Arthur E., to Display Producers, Inc. Display stand. 309,537, 7-31-90, Cl. D6-461.000.
Law, Linda K.: *See—*
Eureka, John; Law, Linda K.; and Marsh, David C., 309,521, Cl. D1-126.000.
LDI Mfg. Co., Inc.: *See—*
Welsh, Clarke T., 309,659, Cl. D23-387.000.
Lee, Jae W., to Gold Star Co., Ltd. Humidifier. 309,656, 7-31-90, Cl. D23-356.000.
Lehman, William L. Overflow water containment pedestal or similar article. 309,571, 7-31-90, Cl. D9-455.000.
Lewis, Sally S. Coffee table. 309,539, 7-31-90, Cl. D6-479.000.
Little, David A.: *See—*
Little, Don H.; and Little, David A., 309,583, Cl. D10-78.000.
Little, Don H.; and Little, David A. Combined system analyzer for brakes and lights. 309,583, 7-31-90, Cl. D10-78.000.
Lucasey Manufacturing Corporation: *See—*
Boscacci, William L.; and O'Neill, Edward L., 309,562, Cl. D8-373.000.
Lucky, Ltd.: *See—*
Park, Jong C., 309,657, Cl. D23-362.000.
M. Kamenstein, Inc.: *See—*
Ancona, Jane; and Ancona, Bruce, 309,545, Cl. D7-507.000.
Maass, James A.: *See—*
Carter, Joseph F.; Stewart, John F.; and Maass, James A., 309,616, Cl. D15-138.000.
Mack, Henry J., Jr.: *See—*
Fortune, Duane D.; Joffe, Richard M.; Mack, Henry J., Jr.; McGarvey, John N.; and Zambelli, Michael P., 309,605, Cl. D14-140.000.
MacVeigh, Harry R. Toy water bed. 309,642, 7-31-90, Cl. D21-123.000.
Maezono, Takashi, to Tomy Company, Ltd. Sounding toy. 309,637, 7-31-90, Cl. D21-64.000.
Maina, Bruno, to ROJ Electrotex S.p.A. Yarn feeder for textile machines. 309,614, 7-31-90, Cl. D15-78.000.
Makidera, Tooru, to Sharp Corporation. Automatic disc changer for electronic filing system. 309,602, 7-31-90, Cl. D14-102.000.
Mano, Yasuhiko: *See—*
Mizusugi, Kanji; Shiozawa, Hajime; Fukuda, Kouki; and Mano, Yasuhiko, 309,603, Cl. D14-106.000.
Marsh, David C.: *See—*
Eureka, John; Law, Linda K.; and Marsh, David C., 309,521, Cl. D1-126.000.
Martech Enterprises, Inc.: *See—*
Chalberg, Philip E.; and Kawato, Katsumi, 309,652, Cl. D23-207.000.
Martin, James B. Combined cap and sweatband. 309,523, 7-31-90, Cl. D2-244.000.
Matsumoto, Kuniyasu: *See—*
Sawada, Masaji; and Matsumoto, Kuniyasu, 309,601, Cl. D14-100.000.
Mayuzumi, Keiko, to Seikosha Co., Ltd. Travel alarm clock. 309,574, 7-31-90, Cl. D10-18.000.
McCloskey, Don R., to Black & Decker Inc. Food blender. 309,548, 7-31-90, Cl. D7-378.000.
McDaniel, Alvin R.; Wood, Edgar B.; Hanh, Lyle D.; and Milton, Ted L., to Innovative Design & Marketing, Inc. Vending machine. 309,634, 7-31-90, Cl. D20-7.000.
McGarvey, John N.: *See—*
Fortune, Duane D.; Joffe, Richard M.; Mack, Henry J., Jr.; McGarvey, John N.; and Zambelli, Michael P., 309,605, Cl. D14-140.000.
McGrane, Eugene W., to Homac Mfg. Company. Set screw transformer connector. 309,664, 7-31-90, Cl. D13-146.000.
Meisner, Edward, to Anchor Hocking Corporation. Covered food storage bowl or the like. 309,554, 7-31-90, Cl. D7-602.000.
Merritt, Darlene R. Breast feeding bib. 309,522, 7-31-90, Cl. D2-229.000.
Meyer, Anton. Toy building block. 309,638, 7-31-90, Cl. D21-108.000.
Microvue Products: *See—*
Chaikin, Peretz, 309,621, Cl. D16-225.000.
Mileos, George; and Brainard, Robert H., to Kraft General Foods, Inc. Combined package and dispenser for extrusible comestibles. 309,566, 7-31-90, Cl. D9-306.000.
Milton, Ted L.: *See—*
McDaniel, Alvin R.; Wood, Edgar B.; Hanh, Lyle D.; and Milton, Ted L., 309,634, Cl. D20-7.000.
Mita Industrial Co., Ltd.: *See—*
Tanizawa, Akiyoshi; and Murakami, Masahiro, 309,631, Cl. D18-42.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Ohsawa, Osamu; Nagahashi, Takichi; Ito, Tatsuo; Ito, Hisayoshi; and Kondo, Nobuyuki, 309,598, Cl. D13-162.000.

Mizusugi, Kanji; Shiozawa, Hajime; Fukuda, Kouki; and Mano, Yasuhiko, to Sharp Corporation. Portable computer. 309,603, 7-31-90, Cl. D14-106.000.

Mo Yau Kee, Peter. Vanity table. 309,536, 7-31-90, Cl. D6-397.000.

Monroe Systems For Business, Inc.: *See*—
Sereika, Joseph C.; Barner, Terry L.; and Perelli, Thomas, 309,629, Cl. D18-11.000.

Murakami, Masahiro: *See*—
Tanizawa, Akiyoshi; and Murakami, Masahiro, 309,631, Cl. D18-42.000.

Muras, Robert: *See*—
Spring Steven; and Muras, Robert, 309,552, Cl. D7-589.000.

Nagahashi, Takichi: *See*—
Ohsawa, Osamu; Nagahashi, Takichi; Ito, Tatsuo; Ito, Hisayoshi; and Kondo, Nobuyuki, 309,598, Cl. D13-162.000.

Nakagawa, Teruo, to Kubota Ltd. Internal combustion engine. 309,612, 7-31-90, Cl. D15-1.000.

Nakatani, Akihiro, to Sumitomo Rubber Industries, Ltd. Automobile tire. 309,590, 7-31-90, Cl. D12-147.000.

Nemeth, Bradley M., to Wendell R. Brooks, Inc. Adjustable copy holder for computers. 309,607, 7-31-90, Cl. D14-114.000.

Newman, Herman; and Newman, Pearl. Grocery bag with handgrips. 309,565, 7-31-90, Cl. D9-305.000.

Newman, Pearl: *See*—
Newman, Herman; and Newman, Pearl, 309,565, Cl. D9-305.000.

Nomura, Keiko, to Seikosha Co., Ltd. Clock. 309,575, 7-31-90, Cl. D10-24.000.

Noshiro, Mitsunori, to Tomy Company, Ltd. Object matching game device. 309,651, 7-31-90, Cl. D21-206.000.

NutraCare International: *See*—
Kane, James R., 309,547, Cl. D7-323.000.

Ohsawa, Osamu; Nagahashi, Takichi; Ito, Tatsuo; Ito, Hisayoshi; and Kondo, Nobuyuki, to Mitsubishi Denki Kabushiki Kaisha. Remote I/O unit for a sequence controller. 309,598, 7-31-90, Cl. D13-162.000.

Ohtsu Tire & Rubber Co., Ltd., The: *See*—
Shomura, Tatuyuki, 309,592, Cl. D12-147.000.

Olsen, Flemming H., to Interlego A.G. Toy staircase. 309,641, 7-31-90, Cl. D21-109.000.

O'Neill, Edward L.: *See*—
Boscacci, William L.; and O'Neill, Edward L., 309,562, Cl. D8-373.000.

Orlick, Jonathan B.; and Howard, William H., to Orlick, Jonathan B. Fishing line retriever. 309,644, 7-31-90, Cl. D22-134.000.

Osaka, Kazumi; Hino, Shinsaku; and Wada, Tatsumi, to Sharp Corporation. Magnetic disc drive with coupling member for a word processor. 309,604, 7-31-90, Cl. D14-109.000.

Otake, Yasuo: *See*—
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 309,597, Cl. D13-116.000.

Pacesetter Infustion, Ltd.: *See*—
Gorton, Lanny A., 309,662, Cl. D24-51.000.

Park, Jong C., to Lucky, Ltd. Electronic fumigator. 309,657, 7-31-90, Cl. D23-362.000.

Pentel Kabushiki Kaisha: *See*—
Itoh, Kunio, 309,633, Cl. D19-51.000.

Perelli, Thomas: *See*—
Sereika, Joseph C.; Barner, Terry L.; and Perelli, Thomas, 309,629, Cl. D18-11.000.

Philip Morris Incorporated: *See*—
Prendergast, William; and Dewees, John G., 309,538, Cl. D6-455.000.

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Singer, Bruce A. Dental materials box. 309,527, 7-31-90, Cl. D3-78.000.

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Vaccaro, Daniel. Drill bit sharpener. 309,559, 7-31-90, Cl. D8-91.000.
Valenti, Anthony. Tongue brush. 309,528, 7-31-90, Cl. D4-104.000.
Van Camp, Raymond E., to Bunn-O-Matic Corporation. Combined coffee making and hot water dispensing machine. 309,546, 7-31-90, Cl. D7-308.000.
Vicenes, Rudy, to Spaeth Design. Knock-down topiary form. 309,587, 7-31-90, Cl. D11-149.000.
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Drewlow, Lyndon W., to Mikkelsens, Inc. Kalanchoe plant named bashful. 7,284, 7-31-90, Cl. 68.000.

Drewlow, Lyndon W., to Mikkelsens, Inc. Begonia plant named Camelot. 7,285, 7-31-90, Cl. 68.000.

Drewlow, Lyndon W., to Mikkelsens, Inc. Kalanchoe plant named Passionate. 7,286, 7-31-90, Cl. 68.000.

Framptons Nurseries Ltd.: *See*—
Lintott, Keith G., 7,287, Cl. 80.000.

Huber, Tony, to W. H. Perron et Cie. LTEE. Primocane raspberry named "Per Hub". 7,283, 7-31-90, Cl. 46.000.

Lintott, Keith G., to Framptons Nurseries Ltd. Chrysanthemum plant named Siglo. 7,287, 7-31-90, Cl. 80.000.

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Drewlow, Lyndon W., 7,285, Cl. 68.000.
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CLASSIFICATION OF PATENTS

ISSUED JULY 31, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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196 R	4,944,265
302	4,944,266
339	4,944,267
342	4,944,268
399	4,944,269
414	4,944,270
435	4,944,271
438	4,944,272
440	4,944,273
489	4,944,274
501	4,944,275
520	4,944,276
532	4,944,277
559.1	4,944,278
	4,944,279
627	4,944,280
644	4,944,281

CLASS 126

25 R	4,944,282
41 R	4,944,283
	4,944,284
299D	4,944,285
367	4,944,286

CLASS 128

4	4,944,287
25 R	4,944,288
60	4,944,289
87 R	4,944,290
203.11	4,944,291
204.18	4,944,292
205.24	4,944,293
206.19	4,944,294
393	4,944,296
399	4,944,297
419 D	4,944,300
419 PG	4,944,298
	4,944,299
420.6	4,944,301
422	4,944,302
648	4,944,303
667	4,944,304
683	4,944,305
725	4,944,306
748	4,944,307
751	4,944,308
782	4,944,309
848	4,944,310
849	4,944,311
857	4,944,312
859	4,944,313

CLASS 131

280	4,944,314
283	4,944,315
296	4,944,316
348	4,944,317

CLASS 132

73	4,944,318
238	4,944,319

CLASS 134

3	4,944,807
15	4,944,808
21	4,944,809
23	4,944,810
167 C	4,944,258
	4,944,320

CLASS 135

88	4,944,321
105	4,944,322

CLASS 137

15	4,944,101
113	4,944,324
227	4,944,323
375	4,944,325
414	4,944,326
519.5	4,944,327
528	4,944,328
614.05	4,944,329
625.31	4,944,330
625.65	4,944,331

CLASS 141

1	4,944,332
51	4,944,333
71	4,944,334
95	4,944,335
	4,944,336
174	4,944,337

CLASS 144

208 E	4,944,338
363	4,944,339

CLASS 148

33.1	4,944,811
108	4,944,805
251	4,944,812
260	4,944,813
329	4,944,814

CLASS 149

19.1	4,944,815
19.8	4,944,816

CLASS 150

167	4,944,340

CLASS 156

62.2	4,944,817
71	4,944,818
78	4,944,819
154	4,944,820
161	4,944,821
212	4,944,822
283	4,944,823
286	4,944,824
294	4,944,825
345	4,944,826
384	4,944,827
397	4,944,828
497	4,944,829
567	4,944,830
584	4,944,832
617.1	4,944,833
620.5	4,944,834
620.7	4,944,835
643	4,944,831
645	4,944,836
646	4,944,837
652	4,944,838

CLASS 159

13.1	4,944,839

CLASS 160

98	4,944,341

CLASS 162

46	4,944,840
49	4,944,841
60	4,944,842
101	4,944,843
205	4,944,844

CLASS 164

485	4,944,342

CLASS 165

47	4,944,343
104.33	4,944,344

CLASS 166

206	4,944,345
274	4,944,346
278	4,944,347
	4,944,348
304	4,944,349
373	4,944,350
376	4,944,351

CLASS 172

19	4,944,352

23 4,944,353
47 4,944,354
278 4,944,355

CLASS 174

16.2 4,945,188
32 4,945,189
68.5 4,945,190
69 4,945,191
94 R 4,945,192
113 R 4,945,342
153 G 4,945,193

CLASS 180

79.1 4,944,356
169 4,944,357
197 4,944,358
208 4,944,359
210 4,944,360

CLASS 181

129 4,944,361
213 4,944,362

CLASS 182

2 4,944,364
138 4,944,365
141 4,944,366

CLASS 184

29 4,944,367

CLASS 187

9 R 4,944,368
105 4,944,369

CLASS 188

71.5 4,944,370
73.39 4,944,371
156 4,944,372
251 A 4,944,373

CLASS 192

3.29 4,944,374
8 R 4,944,375
17 A 4,944,376
56 F 4,944,377
89 B 4,944,380
107 M 4,944,378
150 4,944,379

CLASS 198

370 4,944,381
399 4,944,382
468.6 4,944,383
494 4,944,384
495 4,944,385
499 4,944,386
706 4,944,387
731 4,944,388

CLASS 200

5 R 4,945,194
6 B 4,945,195
38 C 4,945,196
148 A 4,945,197
4,945,198

CLASS 202

84 4,944,845

CLASS 203

1 4,944,846
8 4,944,847
35 4,944,848
55 4,944,849

CLASS 204

15 4,944,850
106 4,944,851
129.2 4,944,856
131 4,944,852
157.76 4,944,853
168 4,944,854
181.7 4,944,855
192.15 4,944,857
4,944,858
244 4,944,859
298.23 4,944,860
428 4,944,861

CLASS 206

0.83 4,944,391
6.1 4,944,389
44 R 4,944,390
102 4,944,392
205 4,944,393
256 4,944,394
288 4,944,395
315.6 4,944,396
365 4,944,397
507 4,944,398
509 4,944,399
4,944,400
521 4,944,401
581 4,944,402
594 4,944,403
600 4,944,404
614 4,944,405
621.4 4,944,406
628 4,944,407
4,944,408
632 4,944,409

CLASS 208

49 4,944,862
107 4,944,863
120 4,944,864
121 4,944,865
408 4,944,866
409 4,944,867

CLASS 209

10 4,944,868
173 4,944,869
705 4,944,411

CLASS 210

103 4,944,870
169 4,944,871
170 4,944,872
209 4,944,873
232 4,944,874
4,944,875
321.74 4,944,877
321.75 4,944,876
500.27 4,944,879
640 4,944,880
4,944,881
4,944,882
683 4,944,878
692 4,944,884
701 4,944,885
748 4,944,886
778 4,944,887
782 4,944,883
787 4,944,888

CLASS 211

11 4,944,412
42 4,944,413
59.2 4,944,414
75 4,944,415
87 4,944,416
184 4,944,417

CLASS 215

100 R 4,944,418

CLASS 219

69.12 4,945,200
69.13 4,945,199
110 4,945,201
121.63 4,945,202
121.64 4,945,203
121.69 4,945,204
121.72 4,945,205
121.74 4,945,206
121.84 4,945,207
137.31 4,945,209
137.61 4,945,208
241 4,945,210
385 4,945,211
388 4,945,212

CLASS 220

1 T 4,944,419
1.5 4,944,421
3.3 4,944,420
20 4,944,422
4,944,423
85 P 4,944,424
203 4,944,425
270 4,944,426
406 4,944,427

CLASS 222

55 4,944,428
153 4,944,429
259 4,944,430
276 4,944,431
321 4,944,432
402.2 4,944,433
565 4,944,435

CLASS 223

98 4,944,436
101 4,944,437

CLASS 224

42.45 R 4,944,434
206 4,944,438
326 4,944,439

CLASS 225

1 4,944,440
16 4,944,441

CLASS 226

171 4,944,442

CLASS 227

19 4,944,443
176 4,944,295

CLASS 228

59 4,944,444
102 4,944,445
4,944,446
103 4,944,447
173.2 4,944,448

CLASS 229

73 4,944,449
4,944,450
120.17 4,944,451
120.21 4,944,452

CLASS 235

31 T 4,945,213
456 4,945,214
457 4,945,215
462 4,945,216
472 4,945,217
487 4,945,218
488 4,945,219

CLASS 237

8 R 4,944,453
12.3 C 4,944,454

CLASS 239

59 4,944,455
222.19 4,944,456
242 4,944,457
288.5 4,944,458
305 4,944,459
428.5 4,944,460

CLASS 241

36 4,944,461
100 4,944,462

CLASS 242

18 DD 4,944,463
54 R 4,944,464
4,944,465
55.3 4,944,466
58.4 4,944,470
65 4,944,467
72 B 4,944,468
82 4,944,469
129 4,944,472
131.1 4,944,471

CLASS 244

129.5 4,944,473

CLASS 246

122 R 4,944,474

CLASS 248

71 4,944,475
87 4,944,476
150 4,944,477
205.7 4,944,478
222.2 4,944,479
309.1 4,944,480
372.1 4,944,481
562 4,944,482

CLASS 249

83 4,944,483

CLASS 250

201.3 4,945,220
203.1 4,945,221
205 4,945,222
213 V T 4,945,223
213 VT 4,945,224
214 B 4,945,225
214 R 4,945,226
4,945,227
223 B 4,945,228
227.11 4,945,229
227.21 4,945,230
231.14 4,945,231
4,945,232
236 4,945,287
252.1 4,945,233
291 4,945,234
306 4,945,235
309 4,945,236
311 4,945,237
327.2 4,945,238
330 4,945,240
358.1 4,945,239
367 4,945,241
4,945,242
4,945,243
370.01 4,945,244
423 F 4,945,247
461.1 4,945,249
4,945,250
461.2 4,945,245
492.1 4,945,251
492.2 4,945,246
493.1 4,945,248
548 4,945,252
571 4,945,253
4,945,254

CLASS 251

9 4,944,485
101 4,944,484
129.17 4,944,487
129.21 4,944,486
203 4,944,488
306 4,944,489
4,944,490

CLASS 252

32.5 4,944,889
54 4,944,890
62.9 4,944,891
92 4,944,892
171 4,944,893
182.12 4,944,894
299.01 4,944,895
587 4,944,896

CLASS 254

28 4,944,491
104 4,944,492

CLASS 256

23 4,944,493
68 4,944,494

CLASS 261

35 4,944,897
84 4,944,898

CLASS 264

1.2 4,944,900
1.4 4,944,899
19 4,944,901
25 4,944,902
40.1 4,944,903
62 4,944,905
101 4,944,906
220 4,944,907
232 4,944,908
255 4,944,909
572 4,944,910

CLASS 266

100 4,944,495
220 4,944,496
268 4,944,497

CLASS 267

64.11 4,944,498
154 4,944,499

CLASS 269

60 4,944,904
322 4,944,500
4,944,501

CLASS 270

31 4,944,502
95 4,944,503

CLASS 271

171 4,944,504
265 4,944,505

CLASS 272

69 4,944,506
85 4,944,507
119 4,944,509
132 4,944,508
133 4,944,510
137 4,944,511

CLASS 273

1 GE 4,944,512
26 R 4,944,513
51 4,944,514
58 A 4,944,363
167 H 4,944,515
183 B 4,944,516
186 A 4,944,517
4,944,518
243 4,944,519
419 4,944,520
428 4,944,521

CLASS 280

149.2 4,944,522
479.3 4,944,525
689 4,944,523
701 4,944,524
704 4,944,526
741 4,944,527
4,944,528
743 4,944,529
801 4,944,530
806 4,944,531

CLASS 283

70 4,944,532
93 4,944,533

CLASS 285

4 4,944,534
16 4,944,535
319 4,944,536
4,944,537
334 4,944,538

CLASS 291

2 4,944,539

CLASS 293

115 4,944,540

CLASS 294

58 4,944,541
86.29 4,944,543
86.4 4,944,542

CLASS 296

37.1 4,944,544
39.2 4,944,612
43 4,944,545
61 4,944,546
97.8 4,944,547
4,944,548
97.9 4,944,549
100 4,944,550
4,944,551
188 4,944,553

CLASS 297

145 4,944,552
284 4,944,554
330 4,944,555
437 4,944,556
468 4,944,557

CLASS 299

42 4,944,558
86 4,944,559
91 4,944,560

CLASS 300

10 4,944,561

CLASS 301

63 DS 4,944,563
111 4,944,562

CLASS 303

33 4,944,564
110 4,944,565

CLASS 307

17 4,945,255
116 Re.33,285
139 4,945,256
201 4,945,257
270 4,945,258
296.1 4,945,259
296.6 4,945,260
443 4,945,261
451 4,945,262
455 4,945,265
475 4,945,263
4,945,264
570 4,945,266
571 4,945,267

CLASS 310

12 4,945,268
15 4,945,269
88 4,945,270
91 4,945,271
4,945,272
208 4,945,273
256 4,945,274
323 4,945,275
326 4,945,276

CLASS 312

311 4,944,566

CLASS 313

25 4,945,288
105 CM 4,945,286
278 4,945,285
414 4,945,284
450 4,945,283
479 4,945,282

CLASS 315

58 4,945,281
129 4,945,280
201 4,945,279
209 R 4,945,278
226 4,945,289
246 4,945,290
307 4,945,291
387 4,945,292

CLASS 318

7 4,945,293
119 4,945,294
490 4,945,295
538 4,945,296
558 4,945,297
635 4,945,298

CLASS 322

33 4,945,299

CLASS 323

318 4,945,300
902 4,945,301

CLASS 324

73.1 4,945,302
78 D 4,945,303
107 4,945,304
207.17 4,945,305
220 4,945,306
225 4,945,307
309 Re.33,279
4,945,308
345 4,945,309
349 4,945,310

CLASS 328

167 4,945,311

CLASS 329

345 4,945,312
349 4,945,313

CLASS 330

2 4,945,314
4.3 4,945,315
110 4,945,316
301 4,945,317

CLASS 333

12 4,945,318
33 4,945,319
106 4,945,320
119 4,945,321
184 4,945,322
185 4,945,323
202 4,945,324

CLASS 335

16 4,945,325
4,945,326
201 4,945,327
202 4,945,328
219 4,945,329
229 4,945,330
274 4,945,331

CLASS 336

69 4,945,332

CLASS 337

176 4,945,333

CLASS 340

388 4,945,334
426 4,945,335
438 4,945,336
442 4,945,337
455 4,945,277
459 4,945,338
547 4,945,340
551 4,945,339
568 4,945,341
606 4,945,343
610 4,945,344
638 4,945,345
656 4,945,346
689 4,945,347
784 4,945,348
4,945,349
4,945,350
793 4,945,351
805 4,945,352
825.060 4,945,355
825.070 4,945,353
825.31 - 4,945,354
941 4,945,356

CLASS 341

20 4,945,357
143 4,945,359

CLASS 342

122 4,945,360

CLASS 343

715 4,945,361
841 4,945,362
895 4,945,363

CLASS 346

160 4,945,364

CLASS 350

96.18 4,944,567
96.20 4,944,568
4,944,569
96.23 4,944,570
96.29 4,944,571
167 4,944,572
173 4,944,573
245 4,944,574
333 4,944,575
334 4,944,576
346 4,944,577
347 E 4,944,578
396 4,944,579
611 4,944,580
641 4,944,581

CLASS 351

41 4,944,582
45 4,944,583
172 4,944,584
204 4,944,585

CLASS 353

108 4,944,586

CLASS 354

21 4,945,365
62 4,945,366
81 4,945,367
149.11 4,945,368
173.1 4,945,369
173.11 4,945,370
195.13 4,945,371
199 4,945,372
217 4,945,373
304 4,945,374
322 4,945,375
400 4,945,376
402 4,945,377
429 4,945,378
441 4,945,379
443 4,945,380

CLASS 355

27 4,945,381
4,945,382
30 4,945,383
51 4,945,384
202 4,945,385
243 4,945,386
271 4,945,387
296 4,945,388
4,945,389
321 4,945,390

CLASS 356

152 4,944,587
4,944,588
326 4,944,589
350 4,944,590
4,944,591
364 4,944,592
379 4,944,593
446 4,944,594

CLASS 357

19 4,945,391
22 4,945,392
23.5 4,945,393
34 4,945,394
40 4,945,395
46 4,945,396
71 4,945,397
74 4,945,398
4,945,399
4,945,400
81 4,945,401

CLASS 358

12 4,945,402
13 4,945,403
75 4,945,405
80 4,945,406
88 4,945,407
4,945,408
4,945,409
141 4,945,404
4,945,410
4,945,411
142 4,945,412
158 4,945,413
168 4,945,414
195.1 4,945,415
209 4,945,416
210 4,945,417
213.11 4,945,418
4,945,419
213.31 4,945,420
217 4,945,421
298 4,945,422
300 4,945,423
335 4,945,424

CLASS 360

15 4,945,425
70 4,945,426
75 4,945,427
92 4,945,428
4,945,429
4,945,430
96.5 4,945,431
98.02 4,945,432
99.07 4,945,433
103 4,945,434
104 4,945,436
106 4,945,435
4,945,437
121 4,945,438
124 4,945,439
132 4,945,440
137 4,945,441

CLASS 361

42 4,945,358
56 4,945,442
93 4,945,443
101 4,945,444
4,945,445
146 4,945,446
212 4,945,447
273 4,945,449
334 4,945,450
383 4,945,448
386 4,945,451
529 4,945,452

CLASS 362

61 4,945,453
4,945,454
4,945,455
80.1 4,945,456
101 4,945,457
106 4,945,458
284 4,945,459
290 4,945,460
378 4,945,461

CLASS 363

17 4,945,462
56 4,945,463
61 4,945,464
89 4,945,465
97 4,945,466
132 4,945,467

CLASS 364

200 4,945,468
4,945,469
4,945,470
4,945,471
4,945,472
4,945,473
4,945,474
4,945,475
4,945,479
4,945,480
413.02 4,945,476
413.06 4,945,477
413.22 4,945,478
424.1 4,945,481
4,945,482
4,945,483
4,945,484
431.05 4,945,485
431.11 4,945,486
474.02 4,945,487
474.24 4,945,488
505 4,945,489
506 4,945,490
510 4,945,491
512 4,945,492
513 4,945,493
4,945,494
518 4,945,495
4,945,496
4,945,497
521 4,945,498
4,945,499
522 4,945,500
571.05 4,945,501
574 4,945,502
578 4,945,503
709.11 4,945,504
715.03 4,945,505
736 4,945,506
737 4,945,507
802 4,945,508
900 4,945,509
4,945,510
4,945,511

CLASS 365

49 4,945,512
51 4,945,513
117 4,945,514
174 4,945,515
189.01 Re.33,280
4,945,517
189.05 4,945,516
233 4,945,518

CLASS 366

65 4,944,595
69 4,944,596
79 4,944,597
106 4,944,598
132 4,944,599
142 4,944,600
160 4,944,601
337 4,944,602

CLASS 367

48 4,945,519
191 4,945,520

CLASS 368

21 4,945,521
77 4,945,522
285 4,945,523

CLASS 369

44.11 4,945,524
4,945,526
4,945,527
44.12 4,945,525
59 4,945,528
109 4,945,529
291 4,945,530

CLASS 370

3 4,945,531
13 4,945,532
32.1 4,945,533
62 4,945,534

CLASS 371

11.1 4,945,535
22.3 4,945,536
37.1 4,945,537
43 4,945,538
57.1 4,945,540

CLASS 372

13 4,945,539
31 4,945,541
38 4,945,542
55 4,945,543
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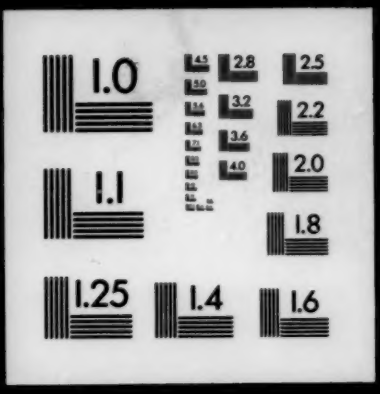
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